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WILDLIFE IN NORTH CAROLINA

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The teeth of megalodon, the greatest predator ever to swim the world's oceans, can occasionally be found along the North Carolina shoreline. **PHOTOGRAPH BY TODD PUSSER.**

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WILDLIFE IN NORTH CAROLINA

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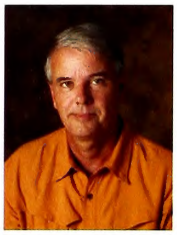
Cover: Antique bass lures — hand painted and with metal components — take on new lives as collectable pieces of angling history. PHOTOGRAPH BY MELISSA McGAW/NCWRC.

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.



EDITOR'S NOTE

Some habits acquired in childhood become so ingrained that they last a lifetime. At least, that's my excuse when I explain my food choices for fishing or hunting trips. I know healthier foods to eat, but I can't get past the fact that the smell of cold pork and beans and fish slime are irrevocably linked in my brain as something very, very good.

MICHAEL MILL

Some friends spend a great deal of time deciding which foods to prepare for fishing trips. I am not one of them, being in the curious predicament of loving to cook, but not caring much about eating. As long as something makes me not hungry when I'm fishing, I'm happy. Fishing, not vittles, is the priority.

Nearly 200 hundred years ago, Jean Anthelme Brillat-Savarin wrote in "The Physiology of Taste," "Tell me what you eat, and I will tell you what you are." I don't believe the Frenchman would have cared to have me as a guest at a dinner party.

When growing up in Granville County and fishing Kerr Lake, our menu was simple: pork and beans, Vienna sausages, sardines, crackers and a soft drink. We didn't live large, but we lived well. And the eating never got in the way of the fishing.

Tastes, however, do change. A few years ago my brother, Sam, and I went crappie fishing at Kerr. In honor of our return to what are our original home waters, we carried along several cans of Vienna sausages. If you've never examined the contents of Vienna sausages, it's best to remain ignorant. I have an idea of what mechanically separated chicken is, but I don't care to dwell on it. And if you're concerned about fat, cholesterol and sodium, take a pass on the little wieners.

We anchored that day beneath the bridge at Clarksville, Va., opened soft drinks and then Vienna sausages. The first bite was the last bite. I tossed the contents of my can in the lake, thinking when they fell to the bottom of the lake, catfish might find them appealing. Unfortunately, they floated.

It felt like the end of something, a passing into the great beyond of one of our cherished foods and memories. I suppose Thomas Wolfe was right, you can't go home again. It does please me, however, that canned pork and beans are just as tasty today as they were 40 years ago.

Jim Wilson

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Winter Fishing Fun

Thanks for your work on *Wildlife in North Carolina*. I always look forward to its arrival. My son in Raleigh gave me a lifetime subscription so I would stop taking his copies. Winter fishing is always fun and wet flies are always—well, most always—productive. I learned to fish wets via Davy Wotton, a Welshman, now living on the White River in Arkansas. Particularly enjoyed [Marty] Shaffner's "Seven Keys." He is right—put a small fly in the right place and get a drag free drift.

Ed Garner
Raleigh

Thanks for the Subscription

Several weeks ago I received a phone call from a gentleman from your office. He was confirming my school address so we could continue our subscription to *Wildlife in North Carolina*. I explained to him that we could not afford to renew at this time. He told me the magazine would be complimentary.

Today we received our second complimentary issue. Thank you so much for allowing us to receive your magazine at no charge. Your organization's support is greatly appreciated, especially in these troubling financial times.

Charlotte Bourdeau
Librarian, Newport Middle School

Too Much Harvesting

My wife and I are longtime subscribers to *Wildlife in North Carolina*, avid outdoors-people (hiking, kayaking, bird and animal watching, fishing … among other outdoor activities). We own property on the Outer Banks and are down there frequently for bird and wildlife observation and enjoying the magic of our coastal isles. We recognize the need for hunting to maintain healthy game populations, and we accord its value as a sport. I was once a bird hunter myself, and we are both avid fisher-people.

But the [November-December] issue of *Wildlife* would have better been entitled "Killing" or "Destroying" Wildlife in NC, rather than "Wildlife." In it you celebrate bear killing in graphic and disgusting detail (including baying hounds, straining at the leash: the underside of the paw of a "harvested" (hunted down and killed) bear; a bear (about to be "harvested") clinging desperately to the branches of a pine; a "harvested" bear being dragged by rope with a stick? rod? through its teeth for "processing;" plus the colonial-looking Oakland Plantation with its rows of "harvested" heads (bucks and bear) ringing the walls of some paneled room with a wagon-wheel chandelier). The article talks briefly of NCWRC regulations and its preservation of lands for breeding, but only in the context of providing bears for killing by hunters with 30-dog packs of hounds.

Another article celebrated the shoulder-to-shoulder line-up of SUVs on the Outer Banks to surf fish. Not a mention in the article of the federal regulations on beach traffic on a national wildlife seashore to protect destruction of shorebird habitat and the hatching grounds for loggerhead turtles, listed as threatened under the Endangered Species Act, nor of the vociferous opposition to these efforts to preserve wildlife by the fishermen with their fat-tired SUVs.

There are two sides to the story of wildlife. The history of over-hunting in this country is shameful. Numerous species, indigenous to all or parts of North Carolina, were hunted or trapped to extinction or near extinction: elk, bison, bears, turkeys, beavers, fishers, Carolina parakeets, to name only a fraction of the total. If this is a wildlife magazine, why not examine, in addition to the joys of blood-sports and celebration of beach-running SUVs, the entire story of the hunts and surf fishing, including environmental effects on wildlife. The excitement of harvesting is only half the story.

Finally, the article on seals to our coast was heartening. One wonders, however, how long it will be before you will be celebrating an open season of harvesting them.

Walter Bennett
Chapel Hill

(Editor's Note: The surf fishing story Mr. Bennett references was an excerpt from Stan Ulanski's "Fishing North Carolina's Outer Banks: The Complete Guide To Catching More Fish From Surf, Pier, Sound, and Ocean," UNC Press) and not intended to address any issue other than the practical aspects of saltwater fishing.)

Wrong Start

I greatly appreciate and applaud efforts by the Wildlife Commission to diversify the focus of the magazine away from just the traditional hunting and fishing, and toward including non-game species such as songbirds and reptiles/amphibians. However, it would help that effort an awful lot to publish correct information. In the article "Spring Offerings in Appalachia" of the March/April issue, you have a picture labeled "redstart," and while that bird may indeed be a redstart, it certainly is not the redstart native to North Carolina. Our native redstart, officially named American redstart, is one of the most stunningly beautiful birds around, and a good photo of one would be an excellent addition to the magazine, if only to show the obvious superiority and value of our native non-game wildlife.

Guy McGrane
Millers Creek

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Written by Mike Zlotnicki
Photographed by Melissa McGaw

Talkin' Turkey

CALLING IS AN INTEGRAL PART OF TURKEY HUNTING. *AND IT DOESN'T HAVE TO BE HARD.*

Bryan Perry took up turkey hunting at the age of 17. Being a novice, he answered an advertisement in *The News & Observer* of Raleigh and went hunting with guide Doug Britton. "He yelped twice, a tom came running and I missed him," Perry remembered. "The next morning he called in a bird I killed. It had a 12¼-inch beard and 1⅝-inch spurs. I've been hooked ever since."

Perhaps the greatest thing that Perry, who lives in Zebulon, garnered from the trip decades ago was the fulfillment of a request by Britton: "He made me promise to learn how to call," said Perry.

Turkey hunting is an addictive pursuit. To be sure, all manners of hunting have their draws; the sight of a trophy buck emerging from a cutover, a flock of ducks pitching in to a decoy spread, a broke bird dog locked up on point. And many types of hunting involve, to some extent, calling or vocalizing to attract or entice game. Sex and food are the usual end games, and turkeys, above all other feathered game, probably involve more calling than others.

After Perry got his first tom, he bought cassette tapes to learn turkey calling. Along the way he got more involved in turkey conservation. He is the current president of the North Carolina chapter of the National Wild Turkey Federation and co-founded the Franklin County Longbeards chapter. He learned to call by asking questions.

"The biggest mistake you can make is not asking someone who knows," he said. "Most grown men don't want to ask someone about something they don't know."

In Perry's opinion, the biggest mistake callers make — especially novice callers — is calling too much. "It's a classic mistake," he said. "People like to hear a turkey gobble. It's exciting. When you're hunting and you get a bird to gobble, he knows where you are. He may come now or at 2 p.m., but he's going to come. If you call and he gobbles right back, quit calling, then wait."

An old Lynch box call in hand, a couple of decoys deployed and a trusty old pump shotgun make for a nice early morning set up. The box call is a good choice when volume is at a premium.

Patience is a virtue, and especially in the turkey woods. Perry referred to what he calls "human patience" and "turkey patience" in turkey hunting. "It's all relative," he said. "Ten minutes to most people is an hour and a half when hunting."

When it comes to calls, Perry likes slate calls and thinks that by-and-large they are the best sounds and most forgiving. They can offer a soft tone easily. But many don't function when wet, whether it's dew, mist or rain. Box calls are the easiest to use and can be high pitched and loud. But, they can be large and cumbersome, and like the slate take two hands to use. The diaphragm call with a latex reed is in the mouth and that makes it a hands-free call. Once mastered they're very versatile. Some people never master the diaphragm due to their gag reflex or have difficulty regulating their volume.

Cadence can be a crutch. Perry said too many people get in a three-yelps-pause, three-yelps-pause rut. "Turkeys don't sound like broken records," he said. "Learn to transition into another vocalization, like yelp to purr and back."

Tone is another issue. "Soft cuts are sentinel calls, loud putts are alarm calls. Watch your tones," he advised.

The Call Maker

Mitchell Johnson is a multiple North Carolina calling champion and the 2010 NWTF Grand National Champion. He also owns Dead End Game Calls in Purlear in Wilkes County, and naturally had some thoughts on the subject.

"The secret is lots of practice and great calls," he said. "The main goal is rhythm and cadence. Also, the more realistic you can sound the more successful you'll be."

Johnson said to sound "realistic" you have to listen to live turkeys. For those of us who see lots of turkeys during deer season (and lots of deer during turkey season) that's not hard. Other good sources are the "Tree Top Turkey" CDs, said Johnson. There are links to instructional videos at his website (deadendgamecalls.com).

As for types of calls, Johnson likes the box call because it's easy to use, realistic and loud. User movement is its main drawback. When focusing on the "slate" calls, Johnson said to look for calls where the striker and slate were matched before packaging. He also commented on surfaces, as there are true slate, glass and aluminum that are popular today.

"Slate is an awesome call for beginners," he said. "It's easy to keep up and not as loud as glass or aluminum. They're good for quiet mornings. Aluminum and glass can be higher pitched. You can condition the glass calls with sandpaper. Make sure you don't put your hand on the aluminum surface; your hand oil will mess it up. You can use alcohol pads for resurfacing."

When scouting during the preseason (which Johnson believes to be critical to success), Johnson said never to use a turkey call to locate birds; it simply educates them. When scouting he's not only looking for gobblers, but also what he calls "boss hens" in the woods. He listens to them to imitate their calls later.

"The boss gobblers know their voices," he said. "And you can definitely call too much. Take his temperature. If he's gobbling a lot I'll hit him with some excited cutting and yelping sequences."

To combine scouting and calling, Johnson has some sage advice: "It's always easier to call a turkey if you know where he wants to go. Set up where you know he's going to travel and he'll be a lot easier to call."

Self-Made Hunter

Walter "Deet" James is a hunting heritage biologist for the N.C. Wildlife Resources Commission and has been hunting turkeys since starting in his native Pennsylvania in 1981. He admits to making every mistake in the book, but also learning from them to become a very successful hunter.

"I can remember the first time. We went to Geiser Guns—a shop which still exists," he said. "We were going to hunt turkeys in Proctor, Pa. Me and two other kids. I remember seeing a Lynch box call behind the counter. 'Show me how to use it,' I said to the man. The next day I called in a jake and two hens and shot the jake. It took several more years to kill another bird. It became an obsession. Turkey hunting consumed me."

James is another who believes that good scouting makes for better calling. "I think there's too much emphasis on calling," he said. "It's more woodsmanship. You need to know where the turkeys roost, feed and their travel routes. When it comes to calling, varying your calling is important. Yelps, clucks, cutting and cackling. Those are excitement calls that can bring a turkey in. My essential calls are yelp, purr, cut and cluck."

In addition to being vocal, James likes to "reflect" his vocalizations to direct an incoming bird. He said a tom can get suspicious of a stationary "hen," so he uses his cupped hand to reflect a call to make it sound like the hen is moving. With friction calls he will turn his torso or cup his vest or coat to "throw" the call. When calling, James likes to combine calls.

"I might start with a couple of clucks, spin into a cut and maybe end with a yelp," he said. "Take the bird's temperature. If he's hot and committed, I call aggressively. I'm gonna lay it on him until he's close enough to see. Then I shut up." He cautioned to not end a calling sequence with a bad call. If you mess up, follow with a good call.

James doesn't limit calling to calls especially in pressured areas. He'll bang his cap against his torso to simulate a fly-down in the morning. You can also scrape it against the tree you're leaning against to simulate movement before flying down. Scratching the dry leaves with your hand or a stick imitates a bird feeding. If your setup is a field edge, a plastic grocery bag can be used to the same effect. Put dried leaves in it for more volume.

One calling tactic that James shared involves an "aggressive hen."

"Say a tom is henned up," he said. "You mimic one of his hens. If she cuts for, say, three seconds, you cut for four. Sometimes she'll come in for a fight and bring the tom in tow."

Lastly, James echoed what the other callers said: Persistence pays. Don't ever give up. "Turkeys are individuals, like people," he said. "What works for one might not work for another."

Mike Zlotnicki is the associate editor of Wildlife in North Carolina. *He may be reached at 919-707-0175 or mike.zlotnicki@ncwildlife.org.*

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(clockwise from top) A diaphragm (mouth) call, a slate call with striker, a yelper fashioned from a turkey wing bone, and a box call. To hear live turkey vocalizations, go to nwtf.org/all_about_turkeys/calling_tips.html.

Common Calls

YELP:
Call made by both male and female turkeys to communicate.

CLUCK:
Short, soft, contentment call often used in combination with yelping.

PURR:
A very soft "rolling" sound made by turkeys when relaxed or feeding.

CACKLE:
Fast series of yelps hens use to excite gobblers or when flying up to or off of the roost.

CUTTING:
Fast series of clucks hens make when excited (often used to excite gobblers).

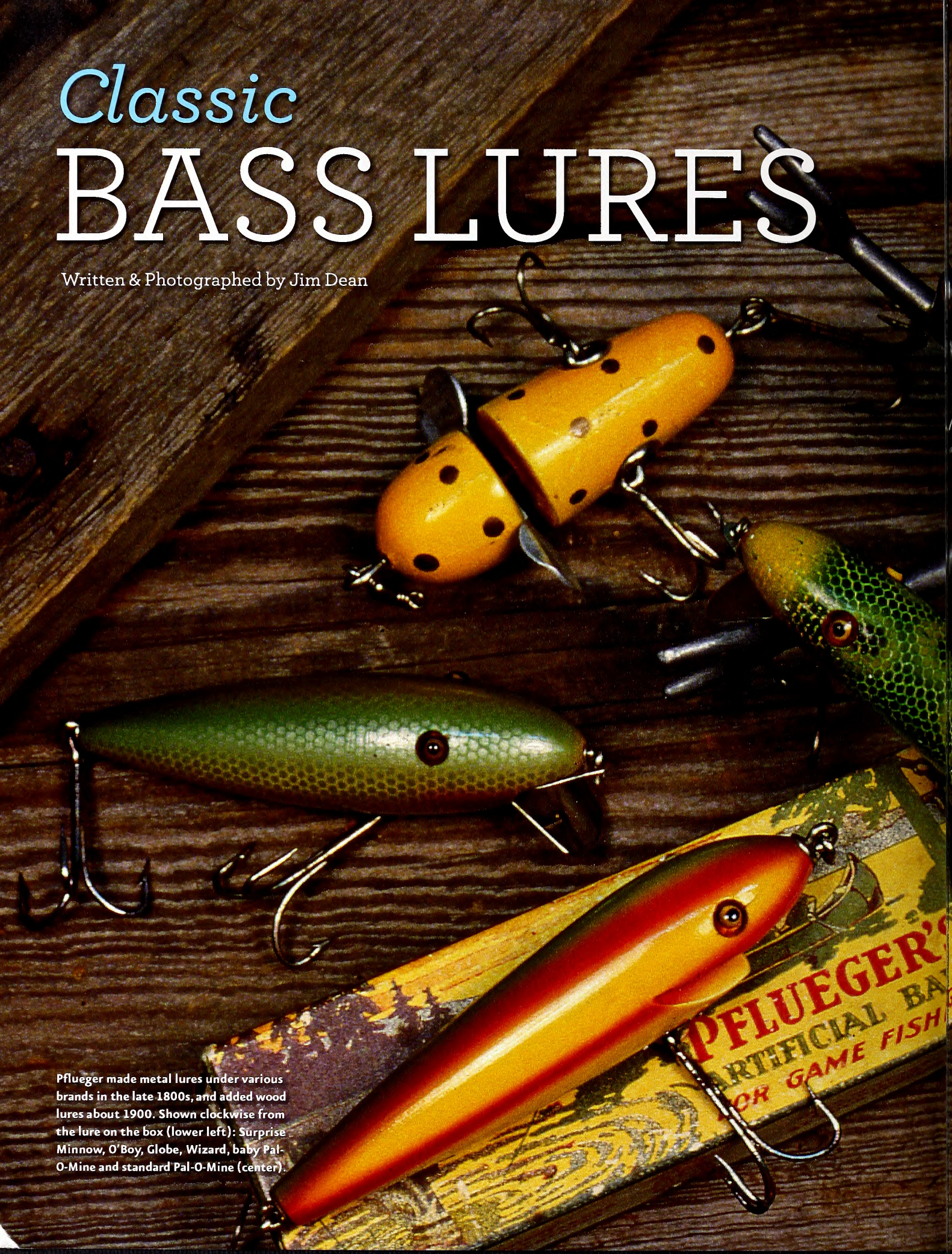
GOBBLE:
An awesome sound that male turkeys make to attract hens for mating (hens can gobble as well).

PUTT:
Often referred to as an alarm putt, this call warns other turkeys of danger.

KEE-KEE:
A "whistling" call used in the fall by young birds when lost or separated from the flock (often accompanied by a series of yelps or a kee-kee run).

Classic BASS LURES

Written & Photographed by Jim Dean



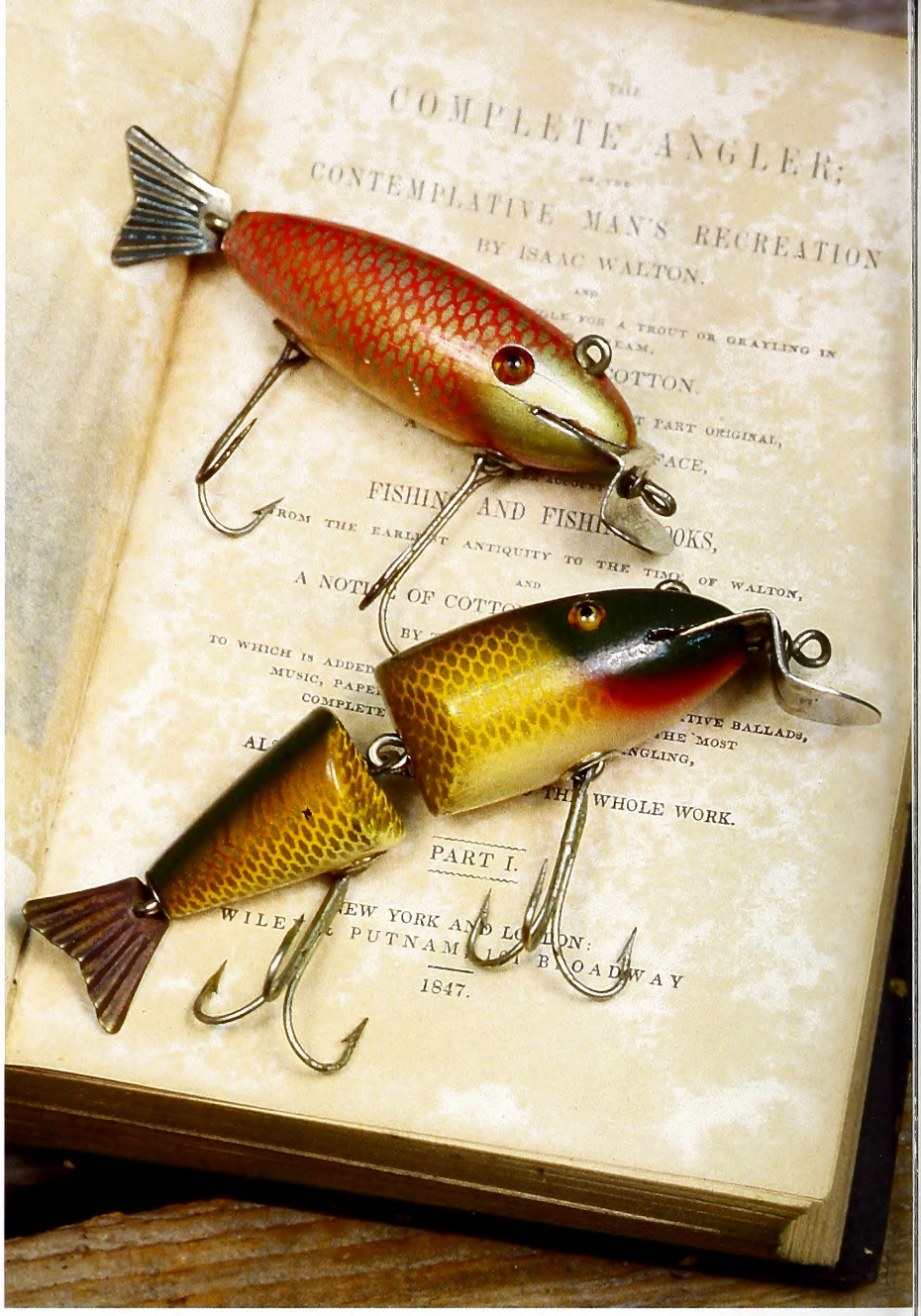
Pflueger made metal lures under various brands in the late 1800s, and added wood lures about 1900. Shown clockwise from the lure on the box (lower left): Surprise Minnow, O'Boy, Globe, Wizard, baby Pal-O-Mine and standard Pal-O-Mine (center).

PART 1 of 2

A brief history of bass lures, rods and reels, with emphasis on the golden age of bass fishing from 1900 to 1940.

Fishing for largemouth bass has never been more popular than it is today, a phenomenon that can be traced to influences that began shortly after World War II. The post-war construction of countless large lakes impounded across the country to provide water and flood control set the stage, followed by environmental awareness of the need to improve water quality in many existing lakes and rivers. Stocking by state and federal agencies extended the range of the largemouth bass throughout the lower 48 states, while improved fisheries management resulted in healthy populations of bass and the forage fish they feed upon.

The rapidly expanding popularity of competitive tournament fishing beginning in the 1960s also played an important role, introducing many anglers to the sport, refining tactics and encouraging tackle manufacturers to develop greatly improved rods, reels and lures, as well as boats, trolling motors, depth recorders and other accessories specifically designed to appeal to bass fishermen.



Although tournament fishing has had its detractors, one important by-product has been the widespread adoption of an ethic of "catch-and-release" by most bass fishermen, even those who wouldn't dream of fishing competitively. Limits of largemouth bass are no longer routinely kept, and even trophy bass are often released so that they may be caught again. The result is that bass fishing is arguably better now than ever.

Yet, in the angler's mind, the golden age of bass fishing may always be linked to that period beginning in the 1800s when fishermen began the transition from fishing with natural bait to artificial lures and, particularly, from the early 1900s through the 1940s when enterprising individuals and manufacturers brought forth an amazing array of innovative and colorful lures made from wood and metal—many of them at least partially hand-crafted—specifically designed to catch largemouth and smallmouth bass.

Revolving spool casting reels, hand-crafted by watchmakers in Kentucky and New York in the mid-1800s, were refined and matched with shorter rods to cast these lures. This new equipment quickly found many converts despite resistance from traditionalists who believed it was far more honorable to fish with natural bait using methods not greatly changed since they were espoused by Izaak Walton in *The Compleat Angler*, first published in 1653.

Dr. James A. Henshall, author of *The Book of the Black Bass*, first published in 1881, is famous for the statement that the black bass is "inch for inch and pound for pound the gamest fish that swims." Yet, ironically, although Henshall is the acknowledged father of bass fishing, he despised the lures and tackle we have come to love and associate most closely with the classic era of bass fishing.

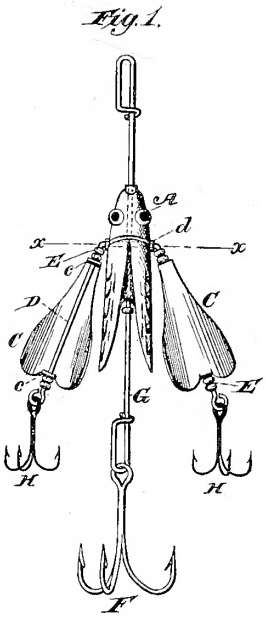
"There are," Henshall wrote in a later edition of his black bass opus published in 1932, "at this day of culture and refinement, a number of wooden nondescript monstrosities used in fishing, popularly known as 'plugs.' They are usually of an elliptical shape, and armed with two to four cheap triangles or triple hooks, and with or without wings or propellers. They may be white, or painted with brilliant colors, and spotted, streaked, or striped. They are employed as casting baits, and swim or duck or dive, and wiggle and wobble, on or below the surface of the water. It is only fair to say, however, that they catch fish. They are used mostly by those who cast overhead with the short casting stick, called by courtesy a rod, and who consider fishing, not so much as a legitimate sport, as a game, in which the fish has no chance whatever, being yanked or derricked out of its element in the shortest possible time."

Although such "plugs" did not begin to appear until about 1900, many artificial lures made of metal, porpoise hide and gutta percha (an early rubber) were already in use throughout the 1800s. Most were variations of metal spoons or spinners (some with feather or deer-hair skirts) and they were designed to be trolled beneath the surface. One variation involved a very old technique ascribed to American Indians in the deep South in which an artificial lure—usually a spinner or a feathered hook called a Florida bob—was fished on a very long "jigger" pole with the lure manipulated on or just beneath the surface around shallow cover on a short, stout

Most historians credit James Heddon, a bee-keeper who lived in Dowagiac, Mich., with the invention of the first lure intended to float and attract bass to strike on the surface.

line tied to the end of the pole. No reels were used with jigger poles, and if a particularly large bass were hooked, the pole was often tossed into the water to tire out the fish without breaking the line.

Prior to 1900, only a handful of these very early lures employed wood, although Henry C. Brush patented a cork-bodied "floating trolling spoon" as early as 1876, and Harry Comstock patented his famous Flying Helgramite with a lath-turned wooden body in 1883. It is, however, doubtful that they were intended to be fished solely on the surface (Brush's lure sinks slowly), and certainly they were not designed for casting. Other early minnow-type lures with wooden bodies were made in the late 1800s, but they were invariably weighted to sink, and were likely trolled.



Harry Comstock's patent for his famous Flying Helgramite.

The onslaught of the brightly-painted, wooden lures described so venomously by Henshall was apparently the result of a lucky accident. Most historians credit James Heddon, a bee-keeper who lived in Dowagiac, Mich., with the invention of the first lure intended to float and attract bass to strike on the surface. According to family history, Heddon was sitting on the bank of a millpond whittling on a stick while waiting for his fishing buddy to join him. He tossed the stick into the water and a bass tried to eat it. Encouraged, Heddon carved a crude frog and attached hooks to it. It caught fish, and he is known to have carved a few similar frogs for his friends.

In 1898, he and his son Charles began making these lures to sell, but it was not until 1902 that he was granted a patent for a floating wooden lure with a metal collar called the Dowagiac Perfect Surface Casting Bait, affectionately known to lure collectors as the "Slopenose." The lure's name was changed to the Dowagiac Expert in 1904, but a similar round-nosed wooden lure called the Heddon 200 soon replaced the Slopenose. Variations remained in the manufacturer's line until 1929—with some plastic versions still available. Heddon also developed a companion lure called the Dowagiac Underwater, a weighted sinking lure with a single large propeller up front, and a line of two-prop sinking lures called "killers." Heddon added other types of lures and, by 1906, the company was receiving orders for over 200,000 annually.

Though Heddon is usually credited with inventing and popularizing the first true top-water casting lure, it may be fairer to say that this honor should be shared, since a number of lures of this type appeared at about the same time. Many fishing tackle companies were in existence prior to Heddon's discovery, and some were actively developing lures capable of making the transition from trolling to casting. Shakespeare's floating wooden Revolution lure was patented in 1901, and was introduced in hollow aluminum (a quite modern adaptation!) in 1905. Manufacturers such as E. F. Pflueger, Worden (later to become South Bend), and many smaller mom-and-pop outfits operating out of basements and garages had casting lures on the market within this time frame.

Two classic wooden Creek Chub lures (opposite page) are the Deluxe Wagtail Chub (top) and the Wigglefish. A Wigglefish like this is reported to have landed the world record 22-pound, 4-ounce largemouth bass caught in 1932 in Georgia by George Perry. This largemouth (above) was caught on a Heddon SOS surface lure.

Many small companies made innovative lures, including some fairly rare ones like these. Shown clockwise from top, Biff Jr., Rush Tango, Rhodes Swimming Frog (rubber), Shakespeare Evolution (aluminum) and Jamison Coaxer.

MELISSA McGAW/NCWRC

The finest early reels were entirely hand-made, but after 1900, many manufacturers offered nice reels. Horton bought the rights to continue production of the famous Meek reels (left), while Meisselbach (below) offered many popular models.

By 1915, an entire industry had been born, with dozens, perhaps hundreds, of companies large and small adding countless innovations —jointed lures, glass eyes with lifelike pupils, luminous finishes that glowed in the dark, tails that wagged and flapped, rubber legs that waved seductively, glass tube lures that encapsulated real minnows, and even a battery-operated lure with an electric bulb. Lures made of celluloid were also soon available, as well as, Pyralin (an early plastic). The U.S. Patent Office was deluged—if fishermen could conceive of a new material or wrinkle to add to a lure, regardless how bizarre, they attempted to bring it into production. Many caught far more fishermen than fish.

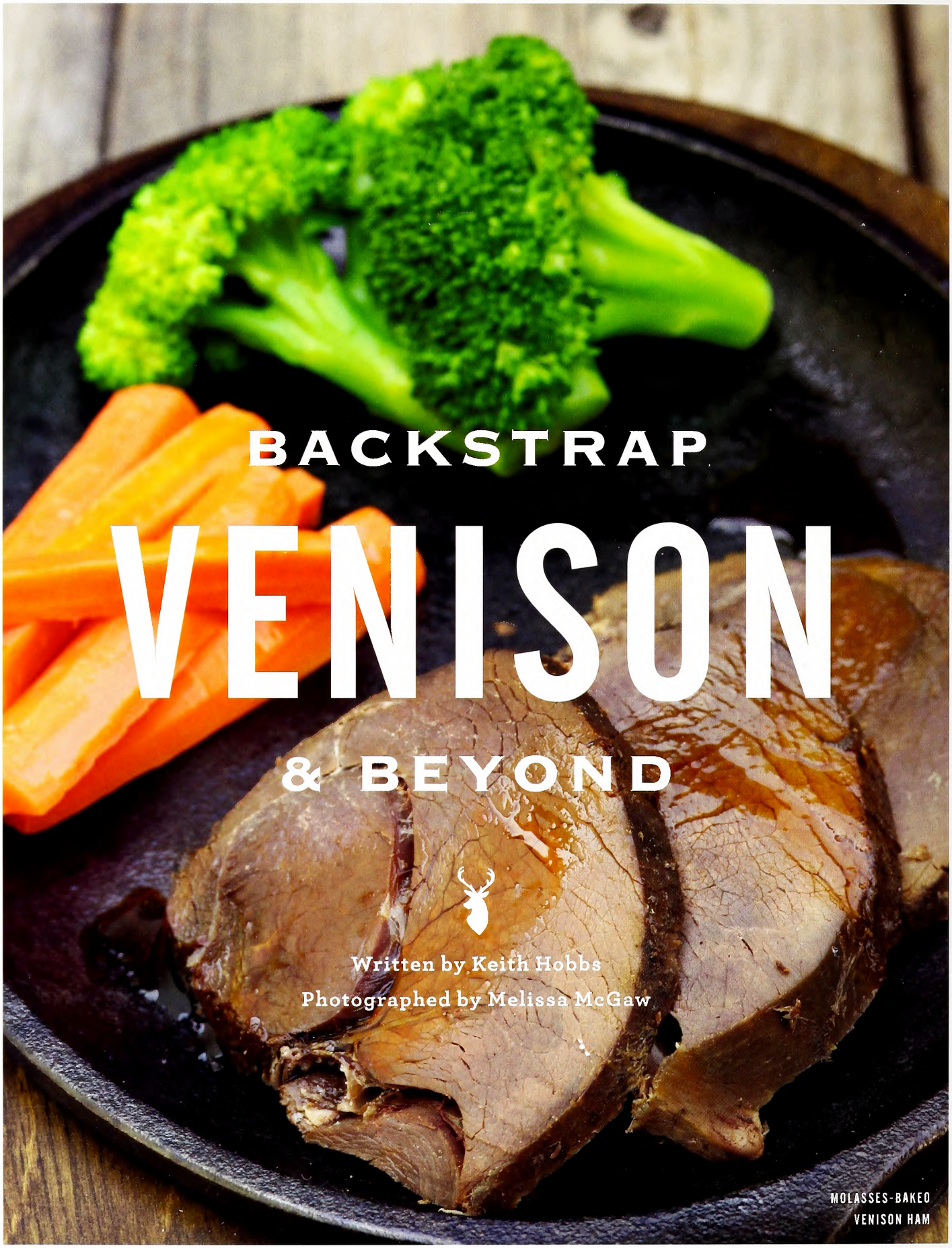
Though some early lures were cheaply and crudely made, many displayed astonishing quality. Wooden lure bodies were intricately carved, some partly by hand, though most were lath-turned from white cedar. Some wooden lures—often painted by women employees—had as many as eight coats of primer and lacquer, and the bright finishes were imaginative to say the least. Heddon developed the crackle finish by accident when a batch of freshly-painted lures were overheated in the drying kiln, and Henry S. Dills of Creek Chub developed the famous scale-pattern finish in 1917, assigning half-rights for its use to Heddon when it was patented in 1919. Metal parts such as propellers, collars and diving lips were engineered to high standards and often engraved in script or stamped with the company's name.

Most of these bass lures were developed and manufactured in the upper Midwest, particularly in Michigan and Indiana, although many companies also prospered through Ohio into New York and New Jersey. The biggest, and best known, of these companies were Heddon, Pflueger, Creek Chub, Shakespeare, South Bend, Moonlight and Paw Paw. In the early years, many lures were sold locally and their fish-catching capabilities were spread by word-of-mouth, but early sporting magazines also began to carry advertisements.

The advances in lure making coincided with improvements in reel and rod design and materials. Prior to about 1875, most reels were primitive, designed primarily to hold line for trolling, and they did not work smoothly enough to make long casts. Those high-quality, hand-made Kentucky reels capable of true "casting" were both expensive and uncommon, and the long, whippy rods equipped with such reels were used to cast natural bait rather than the primitive lures. From 1875 to 1900, however, good-quality manufactured reels began to appear from such manufacturers as Meek, Meisselbach, Conroy, Vom Hofe and others. The period from 1900 to 1930 saw the larger tackle manufacturers—Heddon, Pflueger, South Bend, Shakespeare, Cox, Talbot, Hendryx and others—bring good quality commercial reels to market. Shorter rods, 6-feet long or less, appeared about 1885, but another 25 years passed before such rods gained sufficient popularity to widely replace the longer bait rods. By then, some of these rods were as short as 3 ½-feet long, though 4-½- to 5 ½-foot rods became the standard. The best of these rods were made of split cane or tubular steel. Solid steel rods were very common, but their action tended to be "soft," lacking the stiffness necessary to make long casts and play hooked fish aggressively. ◆

MELISSA McGAW/NCWRC

Part II of this series will appear in the next issue. Jim Dean is a former editor of Wildlife in North Carolina.



BACKSTRAP VENISON & BEYOND

Written by Keith Hobbs

Photographed by Melissa McGaw

MOLASSES-BAKED VENISON HAM

TIRED OF THE SAME OLD DEER DISHES?

Here are some variations on the old and a few new twists to try.

MOLASSES-BAKED VENISON HAM INGREDIENTS

Many years ago, I had the opportunity to host three Cherokee Indians on a deer hunt. It turned out to be one of my best remembered, and most valuable, experiences as a younger, and pretty much still-learning-the-basics hunter.

They had come to Salisbury at the invitation of Vance Eller, my father-in-law, who, along with his wife, Charlotte, were involved with the tribe for many years in many ways, providing much support for a childrens library on the reservation, among other things.

We hunted a small piece of private land—about 100 acres—and by late morning each of the three guests had killed a doe. That's when things got interesting.

I suggested we load the deer into my truck and take them to a cleaning station where winches and gambrels, knives, saws, bone cutters and other various tools we used to skin and butcher deer were available.

The Cherokees were appreciative for the offer of facilities, but they had to get on the road and it was a long drive back up to their mountain home: they would take care of business then and there if that was OK. "Fine by me," I said. "I've got a few tools in the truck you can use," thinking they might at least want to have a small saw, a hatchet for rib-work, and other such things that I and my hunting acquaintances used on a regular basis.

THREE DEER, THREE POCKET KNIVES

Again, they were polite, but one of the men, reaching into his pocket, said they had everything they needed.

He produced a folding knife with one blade, about five inches long, along with a much-used whetstone and they spread the three deer on a clear, grassy piece of ground. The other men produced similar blades and they set to work, stopping only to hone their blades now and then.

As I recall, it wasn't much more than an hour later and they were ready to head home. After asking permission, they left behind, spread around on the ground, the heads (minus the tongues) and entrails—"for the other animals and the birds," they explained.

In addition to the meat, including the livers and hearts, which were prized above the other cuts, went the skins, hooves, tails, ribs, everything but the smell. Nothing was wasted. What little they couldn't use, they left for something else that would. I've always thought that the animals and birds caught a break that day: if the men had gotten bucks rather than does the heads and antlers would have gone back to Cherokee too.

I never saw those men again, but I think of them often when we clean deer at our Bertie County hunting camp. Our skinning pole with two winches, the stainless steel table salvaged from a long-gone restaurant we use for cleaning and butchering, and all the knives, saws, bone cutters, butt-pullers and other assorted tools we use makes me think of our long-ago guests and their pocket knives. What would they think of our set-up for accomplishing what they did on the ground with single blades?

The take-away for me, though, was not how they went about their work so much as how they looked at their kill. They never said anything. They didn't preach. They didn't make a big deal of it, but they didn't waste anything—nothing! It was their way.

Since that time, I've tried heart, liver, and most other parts of a deer. But no tongue yet—maybe next season. Maybe not.

But more times than not, many hunters I've been around wind up keeping only the "choice" cuts. I've never seen anyone turn down hams or backstraps (loins). But, for whatever reason, that is sometimes about all hunters are willing to go to the trouble of keeping when skinning a deer—just the "good" cuts.

WHICH ARE THE "BAD" CUTS?

During recent years, I have come to the conclusion, or maybe revelation, that there are really no "bad" cuts of venison. Some may be more politically correct than others, but there are few parts of a deer that can't be turned into a tasty dish.

And speaking of taste, what does "gamey" mean? Venison is wild game and it tastes like game the same way domestic beef or pork or fowl tastes like what they are. Any cut of any animal,

wild or domestic, that isn't handled properly from the field, or the slaughterhouse, to the table, is going to taste "gamey" or worse. All animals have their textures and flavors, thank goodness.

As for preparation, there will always be grinding for burger and sausage. And the grill will always be fired up for backstraps. But baking, roasting, stewing, braising, sautéing and even corning and frying venison, and, in some fashion, using other cuts that are a little more trouble to bring home, but excellent fare, can add variety to the menu while making use of pretty much the whole animal.

Depending on how a deer is skinned, the tenderloins may stay inside the body cavity. If you're going to open up the deer in a way that you have access to them, they should be removed as soon as possible so the deer's body heat doesn't cause them to spoil. Granted, they are small, but those two strips are prime eating and a shame to waste.

Shoulders of course, can produce small roasts or excellent meat for grinding into burger. A neck roast, another piece often left on the carcass, is fine when prepared properly—tender and tasty.

To take the Cherokees' "waste-not" policies a bit further, the shanks can not only add a significant yield to your burger-grind pile but they can also stand by themselves (a pun a day...). When prepared in a crockpot or Dutch oven, using a lamb shank recipe for instance, they can make a surprisingly tender and flavorful, and not unattractive, presentation.

Or, if you're not quite ready to make the leap to deer shank as an entreé, you might get there in stages. Start by boiling them with a few pieces of carrot, celery and onion, with salt and pepper and some spices, as you would squirrel for Brunswick stew. Pick the meat when it's cooked to the falling-off-the-bone point. It's firm but not tough when slow-cooked with moist heat. The look, consistency and taste is something like squirrel and it can go nicely into many recipes that call for tree rat. Soups and stews other than Brunswick are also possiblities. Again, there's more to a deer than hams, shoulders and backstraps.

SOMETHING OLD

If you're semi-converted and ready to consider stocking the freezer with additional cuts when deer season rolls around again, you could be in for some pleasant surprises. But, for now, we'll turn to some different ways to prepare the venison you may already have on hand.

Since, by the title alone, we're committed to some treatment of backstrap, we'll cover a few simple and quick options for the next time you decide to fire up the grill. Marinades and rubs are probably the most popular ways most of us prep a tender cut of venison for the coals. We've included a list of ingredients for one of each that you may want to try.

A word about flavoring venison: Experienced hunters know that an animal not cared for properly in the field, and during all stages of aging and preparation before it reaches the table, can't be salvaged by any amount of flavoring or method of cooking. So, if you know you've got a quality product to work with, fewer spices and flavors for a shorter time should allow you to enjoy the delicate flavor of quality venison. Complement it, but don't mask it.

That said, the marinade recipe presented here is tried and true. The sesame oil and scallions give this one a bit of a different taste. Using fresh ginger and garlic versus powders or salts (save those

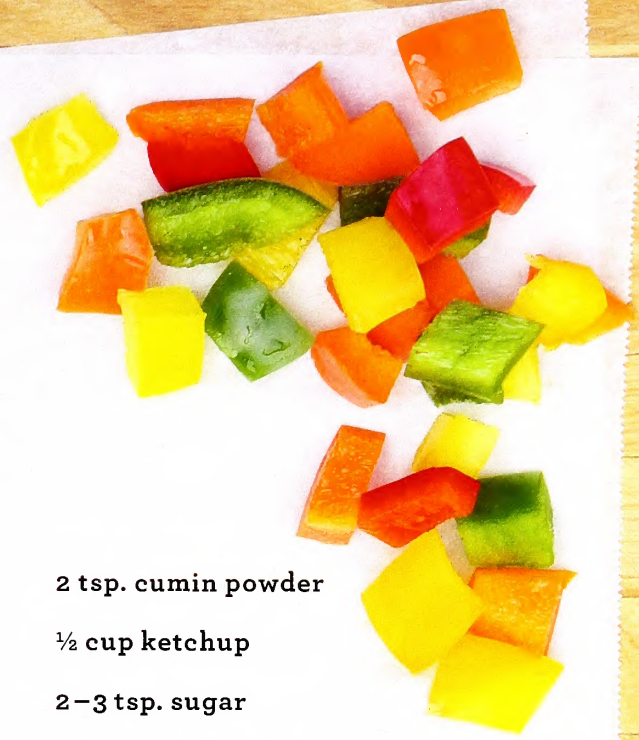
CUBED VENISON CHILI

for the rub) will also help. You may want to marinate your venison in this concoction for one to two days. It will stand a longer soak, but the soy sauce flavor can get pretty strong after a while.

The rub doesn't take as long to do its magic. Apply it and refrigerate the meat, wrapped in plastic wrap, for as little as 30 minutes to an hour and you'll still get acceptable results. I personally enjoy the flavor of venison so I'm not too interested in trying to cover it up or hide the aforementioned "wild" taste. If you're of a like mind, try using only very basic spices like fresh, coarse-ground black pepper and salt plus rubbing the meat with a clove of fresh garlic. If you go the traditional route, try keeping the time between using marinades and applying rubs to a minimum. But if you like lots of spices and a stronger flavor, leave it in or rub it on 'til the spirit moves you.

For a bit of variety, consider cutting a backstrap into three pieces and use a different preparation approach with each piece. In addition to the marinade and rub, a really simple and quick option is a glaze. For a 6-inch or so cut of meat, try a half-cup of good maple syrup and a quarter-stick of butter. Add a dash or three of your favorite hot sauce, or Tabasco, and brush the glaze on the meat as much as you like while it's grilling. But, be quick about it because if you grill venison much past medium rare, you're going to sacrifice much of the flavor and most of the tenderness.

Backstrap is a dense and very lean cut of meat. There is no marbling fat running through it as with beef and it simply won't tolerate drying out from overcooking. If your or your guests' tastes run to medium and beyond, beef tenderloin cooked to order, served with venison around medium rare, would be something to consider.



Shown on page 16

CUBED VENISON CHILI

3 lbs. venison roast cut into cubes

1½ cup chopped onion

1 cup chopped bell peppers (different colors if preferred)

2 tsp. salt

2 cans tomato soup

2 cups water

3 tbsp. chili powder

2 tsp. cumin powder

½ cup ketchup

2–3 tsp. sugar

2 cans black beans (Usually around 15 oz. cans for all beans/drain all cans)

2 cans red kidney beans

1 can pinto beans

2 cans diced tomatoes

As with any chili recipe, ingredients and ratios are guidelines. Next time we may try brown sugar versus white, or some of both, and may add a bit of molasses. Start with the basics and taste as it cooks. Adjust as you see fit. Brown the venison cubes in oil or bacon fat and drain. Combine all ingredients in covered pot. Simmer until done. Makes a gallon or more.

VENISON BACKSTRAP RUB

That way you keep everyone happy and you may even convert some non-game eaters to a healthier red meat.

There are always going to be those folks who, for whatever reason, don't want to "eat Bambi." That's fine. I'm not crazy about escargot, or even snails for that matter. It's a personal thing. I wouldn't push anyone to force down perfectly good, perfectly cooked venison. But it doesn't hurt to make the option available.

SOMETHING NEW

A piece of tenderloin is pretty hard to mistake for something else. But there are ways to serve venison that aren't quite so easily identified.

Should you want to try something new, soak a venison ham in molasses, allspice and salt for three weeks and bake it. Doesn't that sound just swell?

If you think it sounds bad, wait until you see it. It looks like a big lump of coal when it comes out of the marinade and it doesn't get any better looking as it cooks. It just looks like a slightly smaller lump of coal—but looks are deceiving.

We've been cooking venison hams this way for years and I don't remember anyone who didn't comment on how good—and different—it is. It would be a lie to say there haven't been a couple of folks who fell back on calling it "interesting"—a term that can apply to most anything when you don't really know what to say or are trying not to offend—and that's OK, too. Better "interesting" than awful.

Just to put your mind at ease, when sliced, a diamond appears from the lump of coal—it's a rich red color inside and looks much like it tastes.

The recipe covers the amount of the ingredients and the cooking time and methods, as most good recipes do. Just remember to discard the marinade before baking the ham but keep the juices produced during cooking. Again, venison is dense and lean, and some of the juices, or broth, created during cooking can be heated and poured over the dish when served to pick things up a bit if you choose.

Slicing is not the only use for this hard-working ham. You can make a different tasting, and looking, spread from some of the outside or end pieces after slicing the choice cuts for serving as you choose. Simply grind a pound of ham in a food processor, using a chopping or grinding blade and start with a cup of mayonnaise, a cup of pickle relish with some of the juice, and a half-cup of yellow mustard. Blend and taste. Then add more of anything you like if you choose and you'll wind up with about four cups of spread.

If you try the ham recipe and the ham salad and like it, remember that you can freeze pound packages of the cooked ham to make batches of spread at any time. It keeps well and once thawed, takes about 10 minutes to prepare.

Shown on page 14

MOLASSES-BAKED VENISON HAM

2 cups molasses

3 tbsp. ground allspice

½ cup salt

Wash prepared venison ham. Place in sealable plastic bag with other ingredients. Turn occasionally over a three-week period (a few days more or less would probably not be noticeable). Remove ham and discard marinade. Place in baking bag according to directions on package. Place on broiler pan and bake at 325 degrees for 60–90 minutes. Let cool. Remove ham. Reserve cooking juices as a broth or gravy.

VENISON BACKSTRAP MARINADE

1 to 1½ cup soy sauce

1 tsp. minced fresh garlic

1 tsp. minced fresh ginger

¼ cup sugar

3 green onions chopped

2 tbsp. sesame oil

1 tbsp. sesame seeds (optional)

Mix all ingredients in a sealable bag, add venison, and place in refrigerator two days to a week, depending on how strong you prefer the marinade taste. This amount of marinade will handle a good-sized backstrap nicely.

Shown on page 18

VENISON BACKSTRAP RUB

Kosher salt

Fresh ground coarse black pepper

Granulated garlic or garlic powder

Brown sugar

Instant coffee crystals

You're on your own as to the amounts and ratios here. It depends on taste and the size of the piece or pieces of venison you're preparing. Mix all ingredients and pat/rub into the meat liberally 30 minutes to an hour before cooking. Grill over just-grey charcoal or on a very hot gas grill. Again, the cooking time depends on the size and thickness of the meat, grill conditions, and your taste. Medium rare is the suggested doneness.

MAPLE SYRUP GLAZE

1 cup maple syrup

½ stick butter

A few dashes of hot sauce, Tabasco or cayenne pepper

This amount should cover the average whole backstrap adequately. Melt the butter in the syrup with the hot sauce and brush on liberally as you grill the venison. Keep an eye on your backstrap when grilling with a glaze. Sugars burn easily on the grill.

CHUNKY CHILI

Finally, beyond backstrap, way beyond, is chili. Most hunters would agree, I expect, that probably half of all venison consumed winds up ground. The amount of ground venison burger and sausage produced annually in the United States, if put up in pound packages and stacked end-on-end would reach who knows how high. You heard it here first.

We grind our own venison and use lots of it in many dishes. But, for this chili recipe, we used cubed venison for a change. It's not just a Texas thing, and it makes for a different look and taste. A good cut of venison prepared this way can pretty much pass for very lean beef, should you want another way to introduce non-hunters to the healthy pleasures of game.

We cut up a 3-pound venison top round roast for this recipe and the final product—over a gallon of chili—seemed "meatier" than with ground venison. Like the venison ham, this freezes well.

Keith Hobbs lives in Raleigh and has been hunting, fishing and cooking game for many years. This is his first article for Wildlife in North Carolina.

WILDLIFE IN NORTH CAROLINA 2013 PHOTO COMPETITION

***WILDLIFE IN NORTH CAROLINA* MAGAZINE IS PROUD TO ANNOUNCE THE NINTH ANNUAL INSTALLMENT OF OUR POPULAR AND SUCCESSFUL PHOTO COMPETITION.** Last year, more than 1,600 images were entered. This year, your winning photo could be published on the cover of this magazine. Adult photo competition entrants must be subscribers to *Wildlife in North Carolina*. Photographers in the two youth categories (13–17 years old and 12 and under) may enter free of charge.

The cost of the prizes and the prints sent to winners has necessitated that the magazine join the ranks of many other photo contests and charge an entry fee.

The *Wildlife in North Carolina* Photo Competition aims to encourage people to participate in nature photography, thereby fostering greater understanding and appreciation of North Carolina's wildlife and wild places. Winning photographs will be published in the January–February 2014 issue of *Wildlife in North Carolina*. Thanks to our exhibition sponsor, JW Photo Labs of Raleigh, the winners will also be exhibited at the Museum of Natural Sciences and at other science museums and wildlife education centers across the state in 2014.

The N.C. Museum of Natural Sciences, our founding partner, is a fantastic place to learn about North Carolina's wildlife and wild places through its exhibits and classes. These are ideal places to photograph wild animals and wild landscapes. Thanks to partner UNC-TV, you don't have to leave home to become educated about our state's wonderful natural resources—just turn on North Carolina Public Television's programming. Visit ncwildlife.org for more information about the competition. Then get outside and show us your best nature photography.

SHARON CANTER

A crab fisherman tosses his bait into Pamlico Sound as the Bonner Bridge looms in the background.

2013 COMPETITION RULES

WHO MAY ENTER

Amateur and professional photographers, except for employees of the N.C. Wildlife Resources Commission, the N.C. Museum of Natural Sciences, UNC-TV and their immediate families (children, siblings and spouses).

WHAT TO ENTER

Photos will be judged in 10 categories:

Birds

Mammals

Reptiles and Amphibians

Invertebrates

Wild Landscapes: The peaks, valleys, plains and beaches of North Carolina.

Wild Plants and Fungi: Wild-growing plants only, including their flowers, leaves, fruits and other parts. Absolutely no cultivated plants will be accepted.

Outdoor Recreation: Show how people interact with North Carolina's natural world through activities that are inextricably linked to nature, such as hunting, fishing, hiking, rock climbing or canoeing.

Animal Behavior: Anything animals do, from everyday activities to interactions with other animals to unusual behavior.

Youth Photographer, 13–17: Any of the above subjects, shot by photographers under 18.

Youth Photographer, 12 and under: Any of the above subjects, shot by children 12 and younger.

Photographs must have been taken in North Carolina no earlier than Sept. 15, 2006.

You must declare on your entry form if your photograph is of an animal in captivity, such as at a zoo, nature center or rehabilitation facility. Please do not enter photos of animals that are both captive and non-native to North Carolina (for example, polar bears or lions at the N.C. Zoo).

No pets or domestic animals will be accepted, with the exception of animals participating with people in outdoor recreation (for example, hunting dogs or riders on horseback).

Please do not harass wildlife in an attempt to photograph it.

Manipulation of images, either film or digital, should be limited to conventional darkroom techniques or basic sharpening and cropping. Images should contain only the subject matter as originally seen through the viewfinder. Multiple exposures, digitally stitched photos, high dynamic range images and photos containing any manipulated or added content will not be accepted and should not be entered.

Entries may not contain any text aside from that contained in the subject matter. Date stamps, signatures and trail camera information are not permitted, regardless of whether they are added during or after the image is photographed. Original images may be cropped to eliminate date stamps or other text.

An entrant must hold all rights to a photograph. Photos previously published or pending publication, or that violate or infringe upon another person's copyright, are not eligible. Please do not infringe on the rights of property owners in an attempt to photograph animals.

HOW TO ENTER

Visit ncwildlife.org, click on the Photo Competition link, and then click the Enter a Photo link to submit a photograph. Only JPG files smaller than 2 MB will be accepted for upload. Upload your photo using the online entry form on the website. Repeat this process for each photo entered. Entrants may submit a maximum of two (2) photos per category.

The competition begins at 8 a.m. on Monday, June 3, 2013. Entries must be uploaded by 5 p.m. on Sunday, Sept. 1, 2013. Entrants may verify receipt of entries by checking ncwildlife.org and clicking the Photo Competition link to view a text list of all entries.

An image may be entered in only one category. For instance, if a photo of a preening wood duck might fit in Birds or Animal Behavior, you must choose the one category in which you want the image to compete.

Entrants in the youth categories must be the appropriate age for the category entered on the closing date of the competition. Once a youth photographer has entered two photos in the proper youth category, they may enter other photos in any other categories they wish.

PRIZES

All winners will be published in the January–February 2014 issue of *Wildlife in North Carolina* magazine and exhibited at the N.C. Museum of Natural Sciences in Raleigh. Winners will also receive a print of their winning entry from JW Photo Labs.

Grand prize: Your photo published on the cover of the January–February 2014 issue of *Wildlife in North Carolina* magazine, plus $200.

First place, all categories: $100.

Second place, all categories: $75.

Third place, all categories: $50.

JUDGES

Winners will be selected by a panel comprised of staff of the N.C. Wildlife Resources Commission, the N.C. Museum of Natural Sciences and professional wildlife photographers.

THE FINE PRINT

By entering the Wildlife in North Carolina 2013 Photo Competition, entrants grant all sponsors the right to publish and use submitted photographs in print or electronic form to promote the competition. Reproduction of entries will include the necessary photographer credit.

Entrants agree that if their submission is selected as a winner, they grant all sponsors the right to display their photograph(s) at venues including but not limited to the N.C. Museum of Natural Sciences. Exhibition of entries will include photographer credit.

Entrants will be asked on the online entry form if their photo was taken in a North Carolina state park. All such entries will be provided to the N.C. Division of Parks and Recreation for possible usage in public information/promotional materials, park displays or agency press releases to various media outlets. Any such usage will include the necessary photographer credit.

Winners will be required to provide original source material—slides, high-resolution digital files or negatives—for reproduction in the magazine and for exhibition prints. Original digital files of winning photos must be accompanied by a color print of at least 4x6 inches.

Wildlife in North Carolina staff will determine entry eligibility.

QUESTIONS?

Please do not call about entries. Send questions to competition@ncwildlife.org.

Enter online at ncwildlife.org.

Grab your camera and good luck!

MILLIONS OF YEARS AGO, ONE OF THE MIGHTIEST PREDATORS ON EARTH SWAM THE SEAS OFF OF OUR COAST.

WRITTEN & PHOTOGRAPHED BY TODD PUSSER

STALKING THE WORLD'S GREATEST PREDATOR

In March of 1971 three young boys were exploring the shoreline of the Lumber River near the town of Lumberton in Robeson County when they stumbled upon an incredible sight, shark teeth lying on the ground near a recently dug sewer line. The most striking thing about the find, other than the fact that the boys were standing over 80 miles away from the ocean, was the size of the teeth. According to the town's newspaper, *The Robesonian*, some of the teeth the boys found that day measured over 4½ inches in length and came from a shark measuring over 50 feet long. Fortunately for bass fishermen on the Lumber River, the remains of the shark the boys stumbled upon that early spring day were not recent but were from an ancient predator that swam the world's oceans some 12 million years ago. The shark known simply as megalodon, Meg for short, grew to the length and weight of a modern day school bus and sported massive jaws lined with serrated teeth more than 7 inches in length.

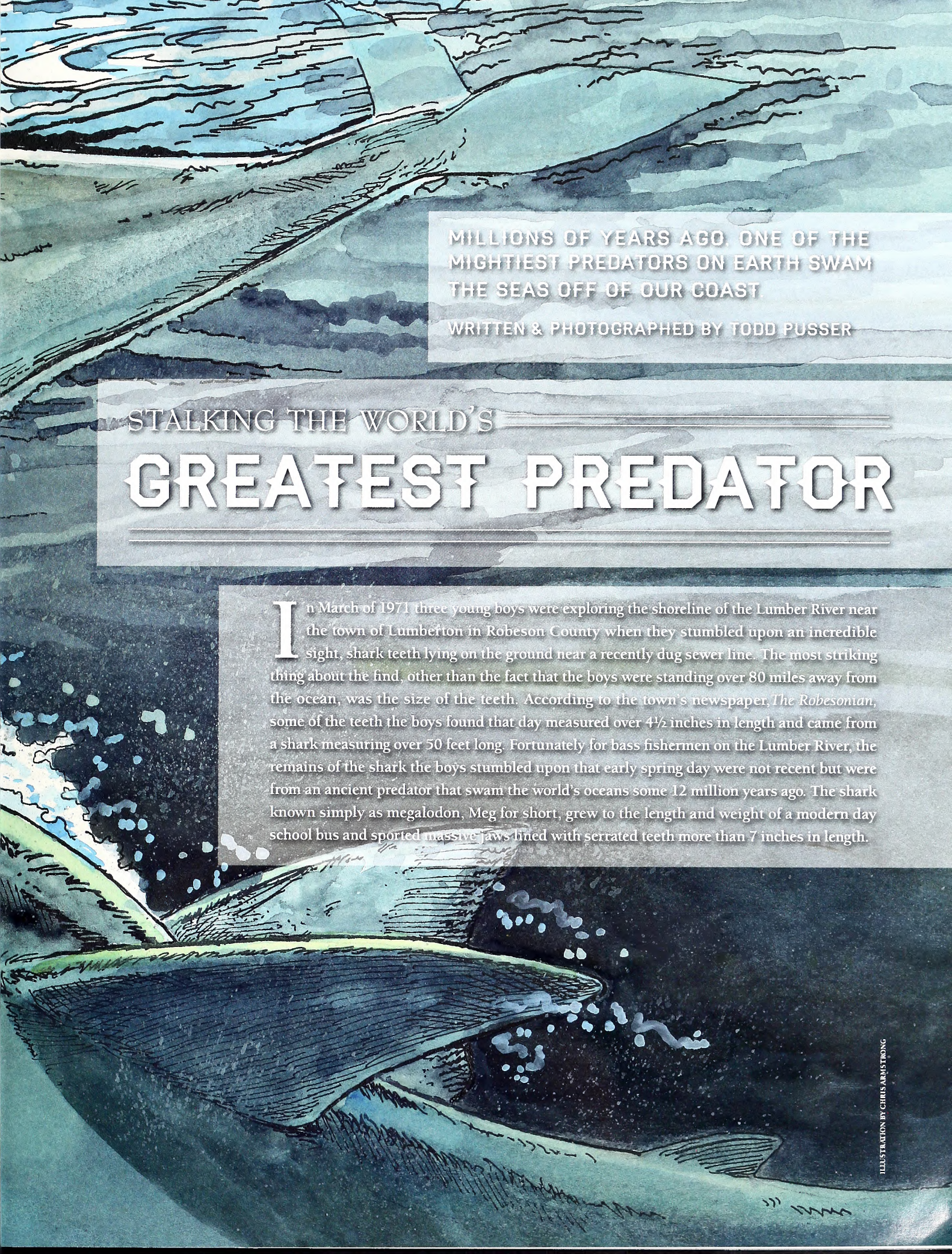
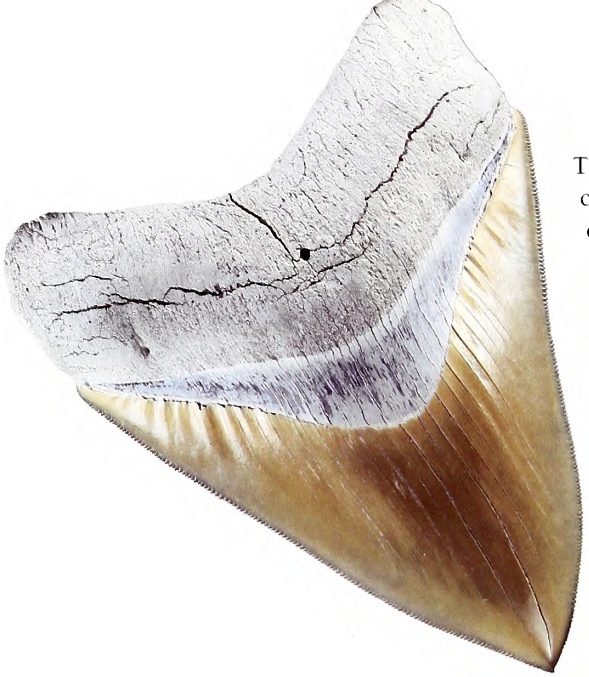


ILLUSTRATION BY CHRIS ARMSTRONG



This nightmarish creature is the largest carnivorous fish ever to swim the world's oceans and remains one of the greatest predators that this planet has ever seen. And this prehistoric behemoth liked calling North Carolina home.

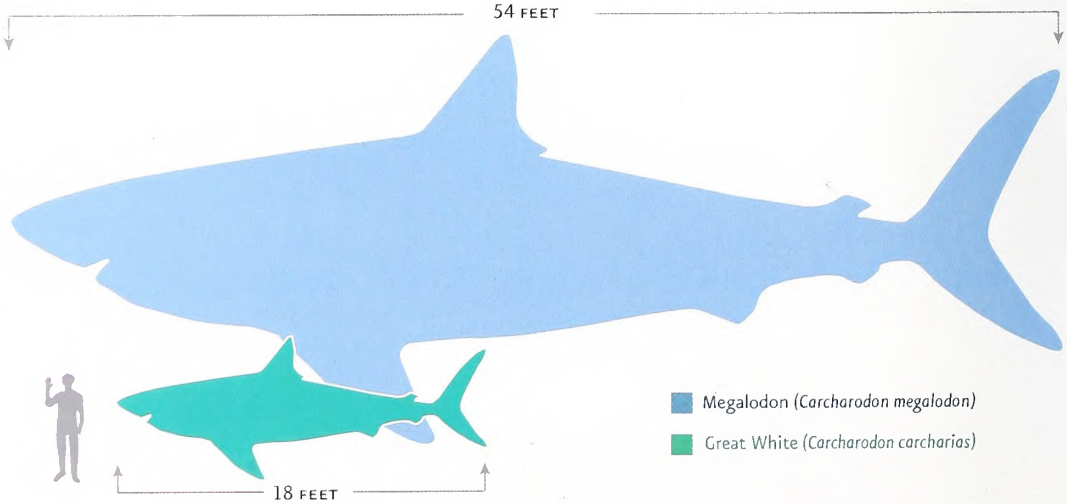
Mankind has known of the existence of this huge predatory shark for centuries. Early observers believed that the large teeth found in rocky locales around Europe were the petrified tongues of dragons. In 1667, Danish naturalist Nicolaus Steno recognized that the teeth were not the culinary utensils of ancient fire breathing reptiles but were in fact remains of a large shark. It would be almost 200 years later before Swiss naturalist Louis Agassiz assigned the shark the scientific name of *Carcharodon megalodon* based on the fact that the size and shape of Meg teeth closely resemble those of a modern day great white shark *(Carcharodon carcharias)*. The name megalodon translates as "great tooth" and evokes a powerful image for the species. Since Agassiz's time, Meg teeth the size of a grown man's hand have turned up in such far flung locales as Morocco, Japan, New Caledonia, Italy, Peru, California and Chile. One known "hotspot" for the species is the southeastern United States, including the Coastal Plain of North Carolina.

Megalodon ruled the world's oceans for almost 20 million years before becoming extinct sometime during the Pliocene Epoch just over 2 million years ago. At this time eastern North Carolina was covered by a shallow, warm ocean. Towns such as Lumberton, Goldsboro, Elizabethtown, Rocky Mount and Tarboro were all underwater.

Accounts of finding Meg teeth in North Carolina go back almost 200 years. Perhaps the earliest account of megalodon from the state comes from American physician and naturalist Samuel L. Mitchell who wrote a chapter in an 1818 book "Essay on the Theory of the Earth" describing a series of vertebrae and teeth from the Coastal Plain town of Murfreesboro:

"About a year ago, the skeleton of a huge animal was found on the bank of the Meherrin River, near Murfreesborough. It was dug out of a hill, distant sixty miles from the ocean. Capt. Neville and Dr. Fowler, who visited the spot, gathered the scattered vertebrae which had been thrown out and laid them in a row thirty-six feet in length. If to this the head and tail be added, the creature must have been perhaps fifty feet or more in length. The former of these gentlemen enriched my collection with two of the teeth and a joint of the back bone that he brought away. The teeth weigh sixteen ounces each. They are covered with an ash-coloured enamel, except at the roots where they were fastened in the jaws. Their figure is triangular, the sides towards the apex measuring six inches each, and the base four inches and a half across. The joint of the back is not cartilaginous, but actually bony. It is in some degree petrified, and weighs twelve pounds and a half. It, in all likelihood, belonged to a shark or a sea serpent."

The size and shape of the teeth Mitchell describes leaves no doubt that the species was megalodon, but the vertebrae he describes may not be from the prehistoric shark. Shark skeletons are made of cartilage, which rarely fossilizes. Perhaps the Meg teeth were found associated with the vertebral column of an



This illustration compares the size of a human with an adult great white shark and an adult megalodon. The prehistoric shark was longer and heavier than a modern day school bus and regularly fed on whales swimming on the North Carolina coast (previous pages). Megalodon teeth reaching up to seven inches in length were serrated on the edges like a steak knife. Combined with incredible bite force these teeth could easily cut through bones of large whales. For size comparison, Richard Chandler holds a megalodon tooth in one hand and a great white shark tooth in the other.

extinct whale, a likely prey item for the shark. If the vertebrae were indeed from a megalodon, it would have been the longest string of backbone known from the species. Unfortunately for the scientific community, the vertebrate were not preserved.

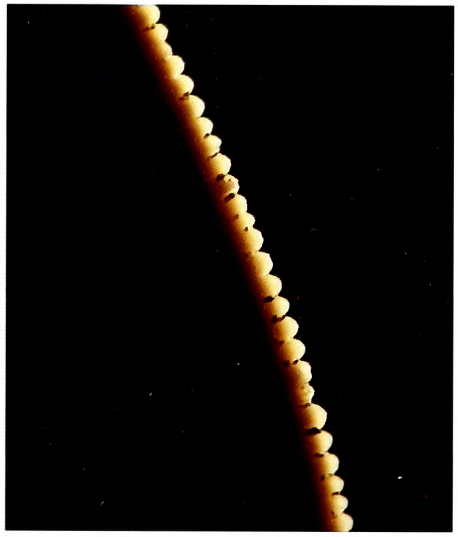
MY WHAT BIG TEETH YOU HAVE

"I was spoiled. One of the first fossils I ever found was a 4-inch tooth of a megalodon," recounts amateur fossil hunter Richard Chandler of Raleigh. He found the tooth along the banks of the Neuse River after a large storm in the early 1980s. "Since that time I have spent most of my free time searching for fossils throughout the coastal plain of North Carolina." Chandler, a retired mathematics professor from N.C. State University, knows a thing or two about fossil sharks. The author of "Neogene and Quaternary Fossils of North Carolina: A Field Guide" is showing me his collection of megalodon teeth. He hands me a particularly hefty triangular shaped tooth. "This is one of my prized possessions," says Chandler.

I examine the tooth closely, turning it over in my hands and admiring its unusual blonde coloration (most fossil Meg teeth are black, brown or varying shades of gray), all the while imagining what it would feel like if this monstrous maul closed down on me. Any doubt that it belonged to a serious predator is removed when I gently run my fingers along the fine serrations of the tooth's edge, still sharp after millions of years. "This tooth was actually found by my wife," says Chandler. They had been searching a well known location for shark teeth in a phosphate mine near the town of Aurora in Beaufort County. Chandler had been digging around in a prime location in the mine while his wife wandered away "perhaps out of boredom," laughs Chandler. A short while later she returned asking him to identify some bits of fossil she had found. Chandler, who had not found anything particularly exciting that day despite hours of looking, quickly identified a small shark tooth and bits of a fossil sea urchin that his wife had picked up on her walk. "Then rather nonchalantly she pulls out this huge tooth from her bag and asks if it is anything special," Chandler fondly recalls. "I had to pick my jaw up off the ground". The tooth had a slant height (measurement of the longest side from the tip of the tooth to the top of the root) over 5 inches. When it comes to megalodon teeth, size does matter. Very large Meg teeth in good shape are highly prized by fossil collectors and commercial dealers alike. Six-inch Meg teeth in pristine condition can fetch several thousand dollars on the internet. The largest complete Meg tooth ever found came from the Morgan River in South Carolina. It measured a whopping 7 1/4 inches in slant height and weighed almost 2 pounds.

The extreme size of Meg teeth often led to outrageous claims about the shark's actual size. When I was 5 years old I vividly recall opening up my grandmother's "Encyclopedia Britannica" and seeing a black-and-white image from the American Museum of Natural History in New York of a group of seven ichthyologists standing inside the reconstructed jaws of a megalodon. For a kid obsessed with monsters and the ocean, that photo taken in 1909 left quite an impression on me. This set of jaws caused some authors to speculate that megalodon reached lengths of 100 feet or more. Scientists now know that the jaws from the photo were reconstructed too large and that Meg likely measured between 50 and 60 feet in length.

The obvious reason megalodon had such large teeth relates to the size of its prey. Chandler believes Meg fed on the abundant whales and dolphins that swam the shallow waters off the Carolina coast during the Pliocene. Numerous fossil whale bones found recovered from the Southeast bear the scars



"AN ADULT MEGALODON COULD CHOMP DOWN ON ITS PREY WITH A BITE FORCE OF AN INCREDIBLE 18 TONS, MAKING IT THE MOST POWERFUL BITE OF ANY CREATURE THAT HAS EVER LIVED."

of megalodon teeth. Whether the whales were scavenged or attacked while still alive is not known. There is no doubt that megalodon had the jaw power to cut through flesh and bone in a single monstrous bite. In 2008, a joint team of scientists from Australia and the United States used advanced computer simulations to calculate the bite force of an adult megalodon. What they found truly boggles the mind. African lions were found to have a bite force of 600 pounds; a respectable amount and downright deadly to impalas. Modern day great white sharks were calculated at having a bite force of about 1.8 tons, enough to decapitate an elephant seal or dolphin in a single bite. By comparison, an adult megalodon could chomp down on its prey with a bite force of an incredible 18 tons, making it the most powerful bite of any creature that has ever lived. Even the bite of the mighty *Tyrannosaurus rex* pales in comparison with only 3 tons of force. All you fishermen out there consider yourselves lucky that Meg went extinct more than a million years ago. If such a creature were swimming around the world's oceans today, you would never take a boat offshore and you might even think twice about venturing out on our state's fishing piers.

THE FAMILY THAT PREYS TOGETHER

As any genealogist can tell you, family trees can be convoluted affairs. This certainly holds true for the relationships between the modern day great white shark and that of fossil sharks such as megalodon. In the realms of the scientific community there is an ongoing debate if the great white shark of "Jaws" fame is the direct descendant of megalodon. At first glance this would seem a reasonable assumption. Both species sport large, broad based teeth that are triangular in shape and have sharp, serrated edges like a steak knife. Some modern day taxonomists even put megalodon and the great white shark into the same genus, Carcharodon, following the nomenclatural ground work established by Agassiz in 1843. However there is growing scientific contingency that believes the great white shark is the descendant of a broad toothed mako shark *(Isurus hastalis)* that swam the seas some 8 million years ago. Recent statistical analysis of teeth shape in juveniles and adults from all the "mega-toothed" sharks seems to support this theory. For that reason, scientists now assign the scientific name of megalodon as *Carcharocles megalodon*, moving it out of the same genus of the great white shark. Whatever view holds up in the eyes of the scientific community it is probably safe to say that megalodon is a distant relative of the modern day great white shark.

TO HAVE AND TO HOLD

Nestled along the southern shoreline of the Pamlico River in the Coastal Plain of North Carolina, the small town of Aurora has received international recognition for the quality and quantity of megalodon teeth found there. For almost 50 years, a phosphate mine has operated on the banks of the Pamlico River near the small town and has produced more megalodon teeth than just about any location on Earth. The teeth are often preserved in pristine condition and have an unusual blonde coloration making them highly prized by collectors and fossil dealers alike. The most spectacular Meg find to come out of the mine took place in 1992. That year, amateur fossil enthusiast Becky Hyne found a rare associated set of 40 large, 5-inch-plus megalodon teeth in one small area of the mine. At the time, it was one of the largest associated sets of Meg teeth found anywhere in the world. These incredible teeth are currently on display in a set of reconstructed Meg jaws at the North Carolina Museum of Natural Sciences in downtown Raleigh.

The phosphate mine of Aurora has produced so many spectacular Pliocene fossils that a small museum was opened along the

main street of town in 1986. For the past 19 years, the Aurora Fossil Museum has hosted an annual fossil fair each Memorial Day weekend, attracting thousands of fossil collectors and enthusiasts from across the United States. I have always wanted to attend the fossil fair, one of the largest of its kind in the eastern United States. So this past Memorial Day, I decided to make a four hour drive from my home town of Aberdeen to the Aurora Fossil Fair in hopes of meeting dedicated collectors who might offer tips on how to find Meg teeth.

Vendors lined each side of the street next to the museum. Amid all the food stands selling cotton candy, sausage dogs and pink lemonade were numerous booths displaying fossils from around the world. The giant teeth of megalodon featured prominently in most booths. Much like fishermen the world over who refuse to reveal the exact location of their "honey hole" it did not take long for me to realize that most fossil hunters are very tight lipped about their favorite locales to hunt for shark's teeth. With good reason, as pristine Meg teeth are very valuable and collectors don't want their favorite sites hunted out.

As it turns out, most Meg teeth on display at the fair were found by divers in the murky rivers that cut through the Coastal Plain of the southeastern United States or near rocky outcrops many miles offshore the North Carolina coast; not areas that can easily be explored by a weekend rock hound such as myself. Inside the museum, I inquired about access to the phosphate mine just outside of town. Unfortunately for liability reasons, the mine has been closed to the public for the last three years, thus squashing any hopes I had of finding my very own Meg tooth.

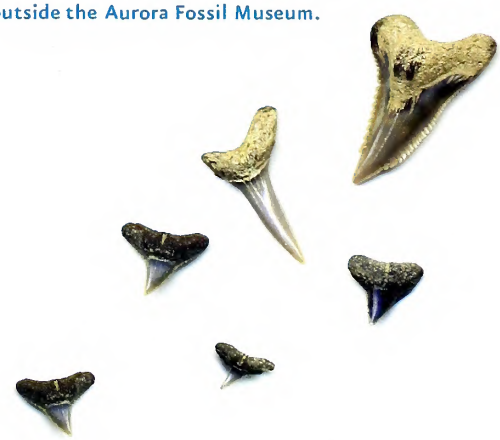
Just as I was about to give up on the idea of finding my very own tooth, I noticed a large sand pile in front of the fossil museum where dozens of people were down on their hands and knees with Ziploc bags and small buckets, patiently sifting through the dirt. The sand pile as it turned out consisted of several dump truck loads of dirt hauled in from the phosphate mine just outside of town and contained a wealth of small fossils and the occasional Meg tooth. With renewed hope for finally finding a Meg tooth I immediately got down on my hands and knees and began digging. After a half hour, I had nothing to show for my efforts but dirty shorts and a few bits of fossil seashells. I should have known that finding my very own Meg tooth was not going to be so easy. Frustratingly, a young girl quietly digging next to me seemed to pick up a shark tooth every few seconds. The teeth she was finding were not those of Meg but were from other smaller sharks that lived in that era, such as sand tiger sharks. Curious as to how she was finding teeth so easily, I asked her what was her secret. Looking at me incredulously she smiled and said "It's easy, just stare at the ground." Taking her advice I stooped and patiently stared at a small section of ground below my feet. After a few seconds I noticed the shiny black enamel of a small shark's tooth protruding above the surface of the sand and then another and another. Once I developed a search image for the color and shape of a tooth buried in the sand, finding them became easy. In no time at all I had a Ziploc bag full of at least two dozen teeth from three species of sharks. Unfortunately none were megalodon.

Despite my lack of success in the spoil pile I had a wonderful time viewing the world class displays of Pliocene fossils in the museum and meeting with amateur fossil collectors who dedicate much of their free time looking for megalodon. I left Aurora with a greater appreciation for this incredible shark as well as several unanswered questions. Why did this predator go extinct? Certainly there were not many things in the ocean that could have preyed on this shark. Did it go extinct due to changing ocean conditions? Perhaps the shark's prey died out or maybe the species suffered from competition from other great sea predators, such as killer whales which started to show up in the fossil record at the same time. No one will ever know the answers to these questions and to me that is part of the special appeal of megalodon. That such a spectacular predator even existed on this planet and that one can find, with a little persistence and luck, its remains in the form of giant teeth sparks the imagination.

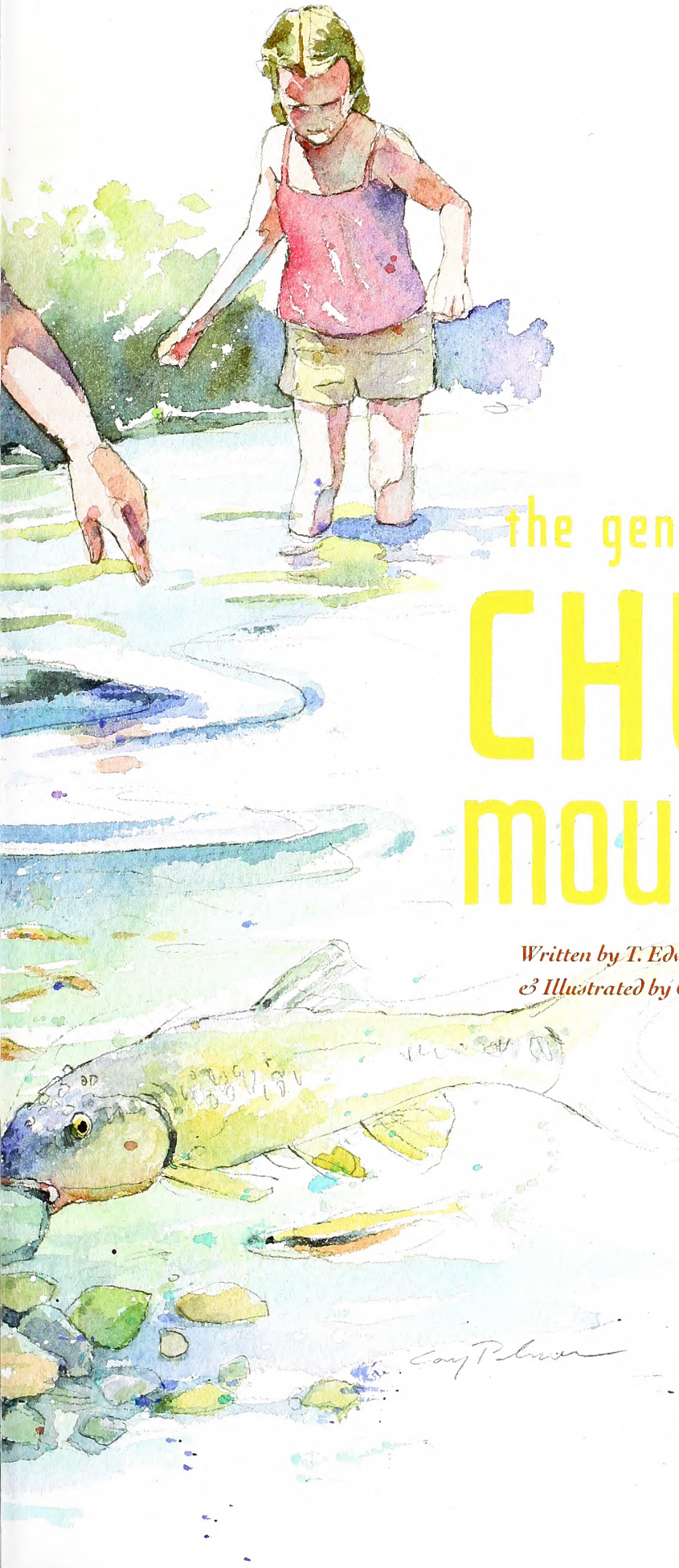
One thing is certain, I will continue to stalk megalodon in the pages of old books of long ago naturalists, on offshore rock ledges that dot our coastline, and in the murky Coastal Plain rivers till I find a 6-inch tooth of this great predator of my very own.

Todd Pusser is a marine biologist and a frequent contributor to Wildlife in North Carolina.

A couple observe a reconstruction of a megalodon jaw at the Museum of Natural Sciences in Raleigh. Below a young girl digs in dirt hauled from a phosphate mine (opposite page top) outside the Aurora Fossil Museum.



Constructing a nursery helps chubs endure, and benefits other fish as well.



the genius of CHUB mounds

Written by T. Edward Nickens
& Illustrated by Gary Palmer

"Oh. My. Gosh," Markie whispers. "Ohmy*gosh*! Look!"

Which is what, at the time, we are doing.

Taking a break from a spring canoe trip down the Dan River foothills, my daughter, Markie, and son, Jack, and I had embarked on a short side hike up a sun-dappled tributary. Wading waist-deep in the clear flow, we'd scattered a Louisiana waterthrush from its nest in a streambank rootball, tracked raccoons and tried to untangle the hieroglyphic trails left in the mud by freshwater mussels. Jack's pockets bulged with "magic crystals"—chunks of quartz—while Markie worked on a keen mica collection. Then, as we rounded a bend in the creek, I caught a flash of color 10 feet upstream.

"Get down!" I hissed. "Quick!"

We dropped to our hands and knees.

At the head of the pool, a dozen or so tiny minnows hover above a mound of small stones that rises a foot-and-a-half from the streambottom like some gravelly monadnock. The fish are brilliant slivers of red and gold, impossibly bright. I hand my polarized sunglasses to Jack. "Awesome!" he crows. The glasses cut the glare from the water's surface, enabling a clear view of the entire water column. "Soooo pretty," Markie coos when it's her turn with the shades. "They look like candy."

Suddenly, a movement catches my eye and I glance across the pool. I suck in my breath—that first dozen redlip shiners are but the lead phalanx of a couple hundred cohorts, a serpentine underwater school of radiant minnows sliding upstream. These are rosyside dace, minnows with pointy snouts, yellow fins and the eponymous red flanks. They are breathtaking even without the benefit of polarized sunglasses, but still I turn into a 10-year-old myself and snatch the glasses from Markie's face. I almost spout out: *Gimme those back, they're mine!*

With the glasses on the underwater world goes tropical. The rosyside dace stream in a sinuous blanket of glittering crimson and gold. Along the edge of the school are a handful of what I think are crescent shiners—deep-bodied fish with red flanks and black bands—and a few unknown fish. I hoot and holler and pass the glasses back to the kids. They are enthralled. We watch the river of dace swarm the mound, noses to the current, and hover like a gelatinous,

Their mound-building efforts are Herculean — if on a Lilliputian scale — and beg the question: Why?

living being comprised of little more than color and glint. For a half-hour our canoe lies forgotten a half-mile away. We've stumbled onto one of the most visually stunning, least-known (at least by non-ichthyologists), behaviorally complex and easily witnessed phenomenon of stream ecology: An aggregation of breeding minnows that attends the nesting mound of a freshwater chub.

Early each spring, clear streams across much of eastern North America host this impressive phenomenon. A group of about 20 species of nest-building minnows — most are large chubs such as the bluehead, bull, and river chub — construct stone nests in which to lay their eggs. One by one, male mound-builders carry stones in their mouths and pile them up. To spawn, male and female chubs hover over the nests, releasing milt and eggs that settle into the nooks and crannies between the pebbles.

Most of the time, they are not alone. By building and maintaining these improbable structures, chubs create a safe community for a host of other small fishes. From April to June, hundreds of dace, shiners, and other minnows might swarm over a single chub nest, taking advantage of the builders' fastidious maintenance and tolerance for interlopers. They arrive in their full spawning colors, which rival the hues of any Caribbean reef-dweller. Scientists have counted at least 13 other fish species that spawn over bluehead chub nests, and there may be many more. At least one of those fish, the gorgeous yellowfin shiner, appears to require chub nests for successful spawning. In laboratory experiments, yellowfin shiners isolated from bluehead chubs neither spawned nor took on their bright pink-red breeding colors. Such a close relationship is called "obligatory symbiosis."

The result, says Gerald Pottern, a consulting stream ecologist who frequents foothills creeks, is a phenomenon "that has attracted a sort of underground cult of chub-watchers. It's amazing. When you walk upright along a stream, the fish react to you as if you're a big, hungry heron. But lay down and all of a sudden you're a piece of aquatic life, and the fish respond to you as such. A lot of them will swim right up to you."

Scientists have taken great pains to study the gravel mounds of the various chub species — and parse out the reasons why these fish go to such pains in the first place. The sizes of the nests are mind-boggling. The nest of a fallfish — North America's largest native minnow — might be 6 feet in diameter and 3 feet high. The stones of one river chub mound were collected, counted and weighed; it contained 7,000 pebbles, with a volume of more than 17 gallons, and weighed 235 pounds. In an analysis of 11 nests built by bluehead chubs, a common fish in many eastern streams, scientists learned that each nest contained an average of 14,500 individually selected and transported stones!

The rocks in our newly found nest are caramel-colored and smooth; the builder seemed to avoid rough-edge quartz and mica. Most are thumb-sized to perhaps 2 inches in diameter, which means the maker must have been a good-sized fish. He never appears, however, despite our patient waiting.

Most likely it's a bluehead chub. Found in Atlantic seaboard states from Louisiana to Florida and north to West Virginia, *Nocomis leptocephalus* is technically a minnow, but it's a stout fish that challenges the preconceptions carried with the term. Growing to 10 inches long, bluehead chubs sport a snazzy brassy sheen year-round, but when breeding the males undergo a physical transformation that would turn a scarlet tanager's head. They take on a pink-blue hue across the head and lower body. Fins turn orange. A large hump appears on the top of the head, and bony horns called "nuptial tubercles" sprout across the snout and head. (These structures are thought to aid the fish in territory defense and stimulation of females.) Then, stone by stone, bluehead chubs go to work. Their mound-building efforts are Herculean — if on a Lilliputian scale — and beg the question: Why?

For starters, scientists figure that the carefully constructed nests provide a safe haven for eggs and larvae, sequestered as they are in a jumble of stones where larger predators

have difficulty finding them. One researcher, William McLarney, observed a river chub in the Tennessee River placing stones on top of its nest after apparently spawning with the female. In addition to safety, the nests provide a finely tuned microhabitat for raising young. For days after spawning, most chubs fuss over the mounds. They bring in fresh stones, sometimes from as far as 20 feet away. They mother the nest, turning pebbles over and over, like a hen turning her eggs, and move them from one place in the pile to another. Such scrupulous housekeeping prevents the accumulation of sediment in the nest. It also increases aeration and enables a constant flush of clean water over and through the mound's developing eggs.

That's especially important in regions, like the Virginia foothills and Piedmont, where clear streams are at a premium. Essentially, Pottern explains, fish have three strategies for getting their eggs out of the way of suffocating silt. "They can stick their eggs on plants or rocks above the stream bottom, lay their eggs in a nest and fan them, or lay eggs in clean gravel," he says. By constructing their own towers of stone, mound-building chubs create a viable nursery habitat for an entire community of fish species.

The aggregation of large numbers of small, brightly colored fish has benefits for the homebuilders, as well. All those smaller fish fanning the nest with their tails could reduce siltation, a chief cause of egg failure. The resulting swirl of bodies and colors could confuse a bass or bluegill hoping for a quick snack of eggs or embryos. The synchronous breeding of stream minnows might also reduce the impact of predators lurking about a chub nest. The sheer numbers of eggs produced in a single mound would swamp the appetites of predators. Some shiner species can lay up to 4,000 eggs per female—a level of fecundity all out of proportion to the size of a 6-inch fish.

But the bottom-line benefit of the chub's "Extreme Home Makeover" tendencies is a direct effect on stream health—and by natural extension, the diversity and health of all the creatures that prey on stream fishes, from barred owls to mink to cottonmouth moccasins. "Chub nests are a significant foundation on which rests the diversity of life in many small streams," says Dr. Robert Jenkins, professor of biology at Roanoke College and the co-author, with Noel M. Burkhead, of "The Freshwater Fishes of Virginia." "These structures are critical to the overall numbers of fish in a stream, because often the most abundant fish species are chub nest associates. I don't know that I've ever seen an active chub nest that was not attended by nest associates. Many aspects of the future ecology of streams are determined at chub nests."

And so, too, is at least one aspect of the future conservation of streams. That's what we are witnessing on this tiny tributary of the Dan. Staying low in the shadows, stalking the creek on hands and knees, my kids can't get enough of the chub mounds. We bypass the first nest and make our way upstream. We find another half-dozen chub mounds, each one squatting at the base of a pool, situated squarely in the tongue of swift water tumbling from small ledges and teeny ripples. At one, some sort of sculpin—big-headed fish that hang out on the bottom of streams—sneaks into the mound after we scatter its inhabitants like so many quail. It scarfs down a few eggs before our shadows send it scurrying away, as well.

Back in the canoe, we steal away downstream. The kids are now keenly focused on the riverbottom, watching for chub mounds in the Dan's main flow. Jack thinks every gravel bar is a fish nest, and I don't dissuade his enthusiasm. We float over a few of the real deal, but we've burned up so much time on our side trip that we have to paddle hard to make the takeout before darkness falls.

Later, on the drive home, I ask the kids what they liked best about the canoe trip—their first time paddling through rapids solo in the kayak, lazing about in the swimming holes, or jumping off the 20-foot cliffs.

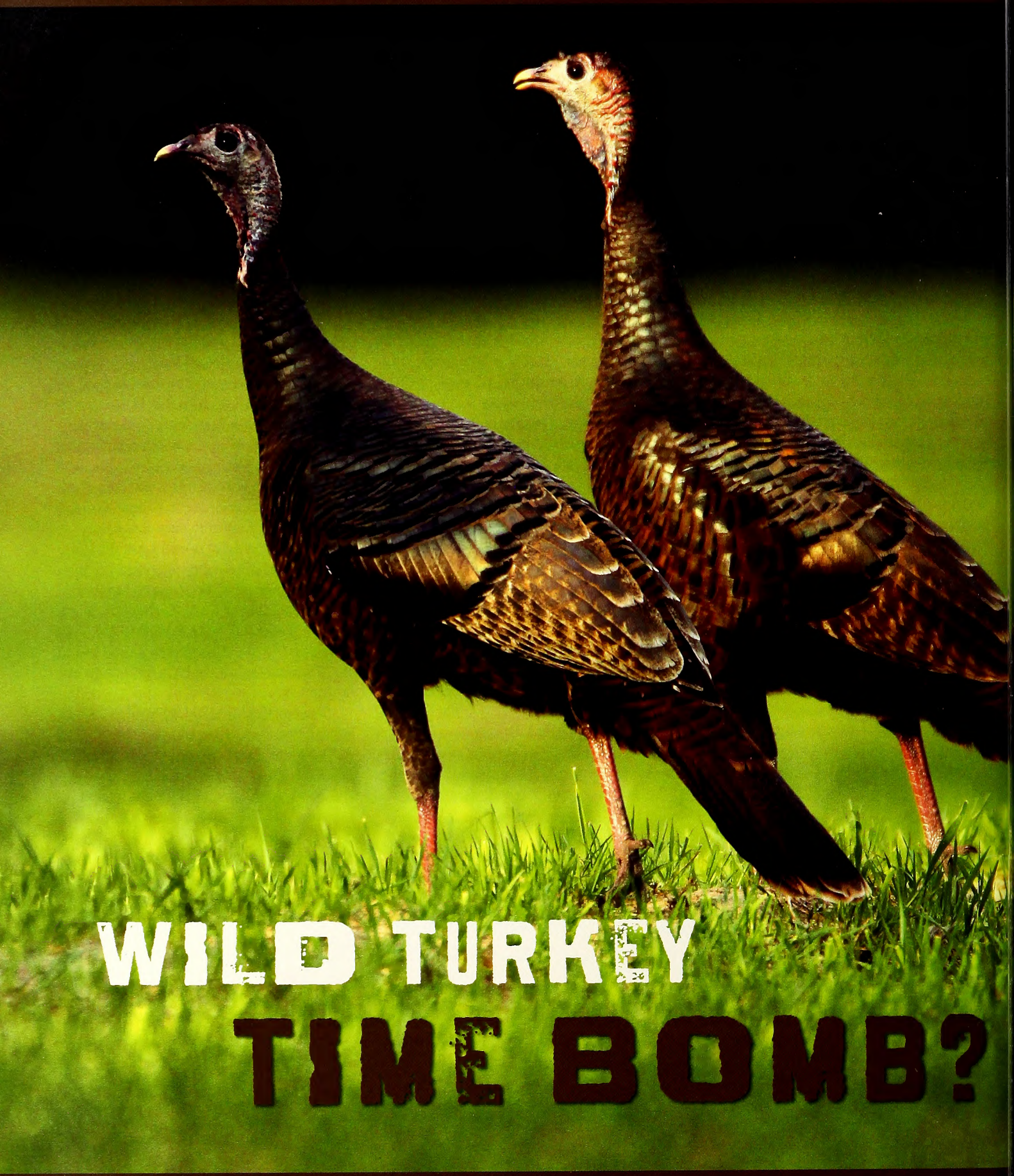
Uh-uh.

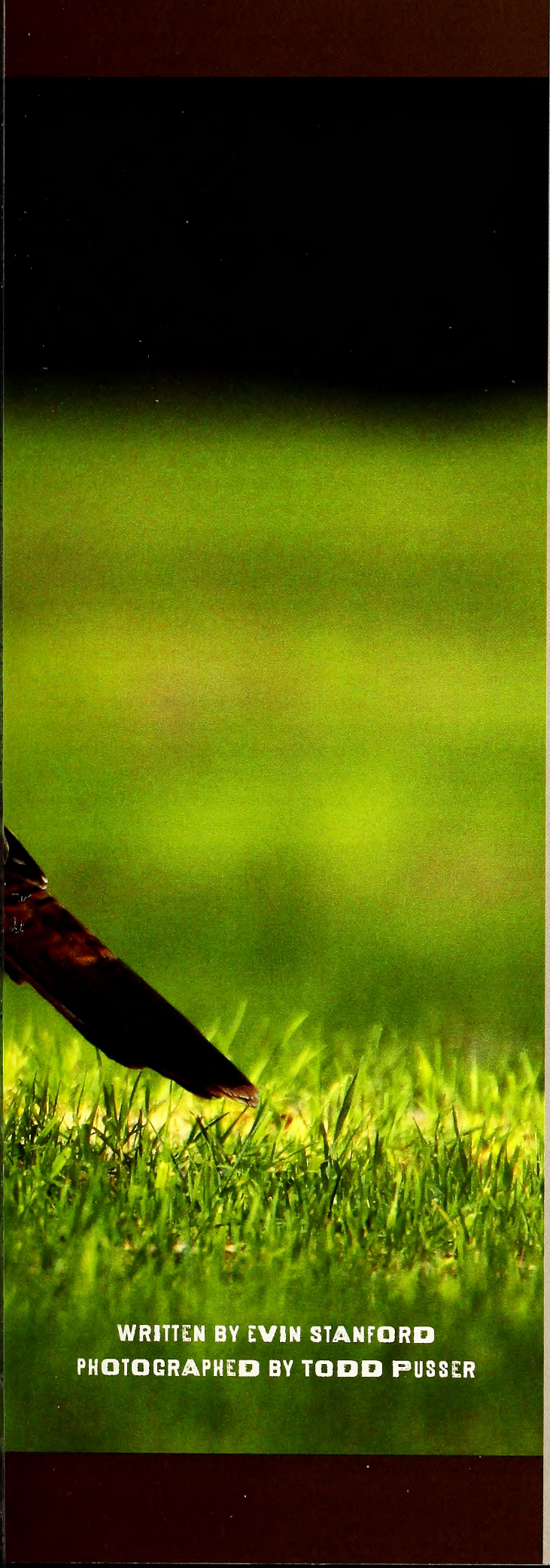
"Fish mounds!" Jack chirped from his booster seat.

"Oh. My. Gosh," Markie chimed in. "Those were the coolest things I'd ever seen."

Which is what I was hoping they'd say.

T. Edward Nickens of Raleigh is a frequent contributor to Wildlife in North Carolina, *as well as* Field & Stream, Garden & Gun, Audubon *and other magazines.*


WILD TURKEY
TIME BOMB?



WRITTEN BY EVIN STANFORD
PHOTOGRAPHED BY TODD PUSSER

Across the SOUTHEAST, biologists attempt to UNDERSTAND THE REASONS behind LONG-TERM DECLINES in WILD TURKEY productivity.

Undoubtedly these times are the heyday of turkey hunting in North Carolina. In 1948, one year after the N.C. Wildlife Resources Commission (NCWRC) was formed, it is estimated that only 10,000 wild turkeys called the Tar Heel state home. That number consistently dwindled over time due to overharvesting, habitat destruction and other factors until the population bottomed out at approximately 2,000 birds statewide around 1970. At that time the possibility of turkey populations rebounding to the levels that we enjoy today was unthinkable.

As most hunters are aware, our state's wild turkey restoration program is responsible for the recovery of turkey populations all across the state. The heroes of wild turkey restoration include numerous past and present NCWRC staff that trapped and relocated birds, cooperating landowners and sportsmen who assisted with the establishment of restoration areas, and the National Wild Turkey Federation that provided financial assistance and logistical support to help make it all happen. The fruits of those efforts are evident today as wild turkeys are now found throughout the state and number approximately 260,000.

This tremendous wildlife management success story is also reflected in the reported harvests of our spring turkey hunters, which have set back-to-back-to-back records each of the last four seasons, with 15,451 birds taken in 2012. Yes, indeed, it appears this is the best time ever to be a turkey hunter in North Carolina, and expectations are high that it will only get better.

What if I told you that may not be the case? There may be a time bomb waiting to go off in our state's population of wild turkeys. What if I told you this time bomb has already gone off in several southeastern states, and currently nobody knows how to diffuse it to keep it from happening elsewhere? Let me introduce you to a phenomenon known as the Southeast Wild Turkey Decline.

NATURE'S WAYS

Just What Is A Turkey's Beard?
See Nature's Ways, page 43.

Georgia's **AND** North Carolina's overall **WILD TURKEY POPULATIONS** are still **DOING WELL** despite the **DROP IN PRODUCTIVITY.**

The Southeast Wild Turkey Decline is a general term wild turkey biologists use to describe long-term decreases in wild turkey productivity, population levels and/or annual harvest that have been observed in many Southeastern states. Almost all state wildlife agencies in the Southeast have documented notable decreases in wild turkey productivity over the long term based on poult-per-hen ratios observed during summer wild turkey observation surveys. Many of the states that have observed these declining productivity trends have also experienced a decrease in population levels and harvest. For those states that have experienced a decline in productivity but have not yet seen a decrease in either population levels or harvest, the question appears to be clear.

Just how bad can it be? In Arkansas, the wild turkey population has decreased by 100,000 birds since the early 2000s, which correlates to a 50 percent decrease in the statewide population. In some parts of northwestern Arkansas, turkey populations have declined more than 75 percent since 2000. In Mississippi the statewide turkey population peaked in 1987 when just over 59,000 turkeys were harvested. Since that time, population levels and harvest have decreased by about 60 percent. In South Carolina the spring turkey harvest peaked in 2002 and has since decreased more than 36 percent. It is believed these harvest trends in South Carolina are reflecting actual population changes over the same time period. This same scenario of decreasing wild turkey productivity followed by a substantial drop in population levels and harvest has played out in several other Southeastern states as well. Some states not experiencing this phenomenon statewide are beginning to see it within localized areas.

What does this mean for North Carolina's turkey populations? Let's look south of the border for a comparison. As you can see in the graph, both South Carolina's and Georgia's wild turkey poult-per-hen recruitment indices have decreased markedly since 1982. Poult-per-hen ratios that used to range between 3 and 4 now consistently range between 1 and 2. The trend in North Carolina has likewise decreased over time since surveys were incorporated into our state's turkey management program in 1988. This decreasing trend in wild turkey productivity is mirrored by almost all Southeastern states that conduct summer wild turkey observation surveys.

Georgia's and North Carolina's overall wild turkey populations are still doing well despite the drop in productivity. However, as mentioned before, South Carolina's population has dramatically decreased with dropping productivity. What is the primary

difference between states that have observed both decreasing productivity and population trends and those states that have observed only decreasing productivity? It seems to simply be time. As I've been told by turkey biologists from Southeastern states that have experienced both decreasing trends in productivity and population levels, all we need is patience. Give it time and the time bomb is likely to go off here too.

A decline in production does not mean a decline in population, and North Carolina is evidence of that. The poult-per-hen ratio, an indication of poult survival, has been declining here for more than a decade, yet the population has not diminished. No one knows why turkey productivity is decreasing across almost the entire Southeast, and no one knows why some states have seen a corresponding decrease in population levels and harvest. Following the restoration of turkeys to suitable but unoccupied habitats, did birds simply not have to compete with other members of the same species? Maybe it's possible this lack of competition created a scenario where recruitment and population growth levels were artificially high for some period of time and are now readjusting to a new reality. However, it's hard for a wildlife biologist to imagine that scenario resulting in population levels dropping as much as they have in Arkansas, Mississippi and elsewhere.

Is it possible a predator-prey relationship is responsible? Perhaps predators did not initially know how to effectively target turkeys as a food source. Over time, as turkey populations became more abundant, it's possible the predator community developed effective strategies to take advantage of this resource. This could result in a lower threshold for sustainable turkey population levels. Are we overharvesting turkeys in portions of the Southeast, or are biologists otherwise lacking an understanding of some fundamental aspect of turkey population dynamics?

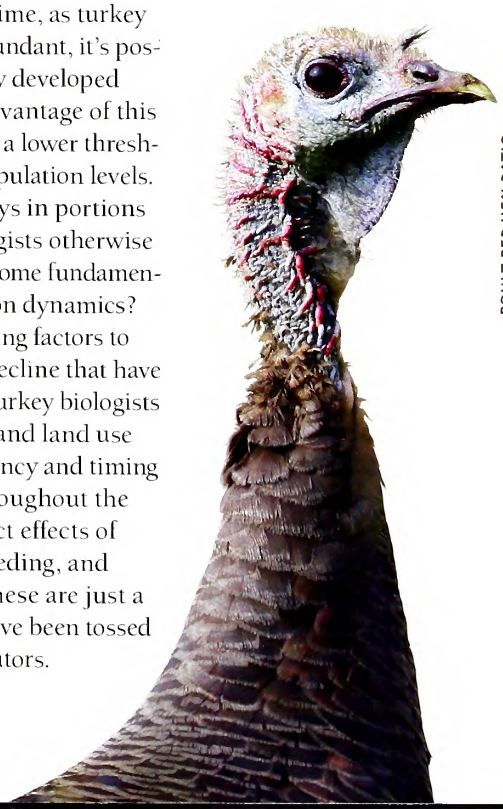
Other potential contributing factors to the Southeast Wild Turkey Decline that have been discussed among wild turkey biologists include changes in habitats and land use patterns over time, the frequency and timing of recent drought events throughout the Southeast, direct and indirect effects of baiting and supplemental feeding, and unknown disease effects. These are just a few of the many ideas that have been tossed around as potential contributors.

By now you are probably asking what we are doing to address this time bomb. In June 2010 the NCWRC hosted the annual meeting of the Southeast Wild Turkey Working Group, a committee of turkey biologists from all Southeastern state wildlife agencies. During that meeting the working group began to develop a list of prioritized research topics to address the Southeast Wild Turkey Decline issue. After much discussion and coordination over a period of several months, the list was finalized in May 2011. Research priorities include: 1) analyses of population, habitat and other trend data; 2) evaluation, validation and standardization of population monitoring techniques; 3) evaluation of changes in habitat suitability for turkeys over time; and 4) development of population modeling techniques that incorporate turkey population dynamics and landscape habitat changes.

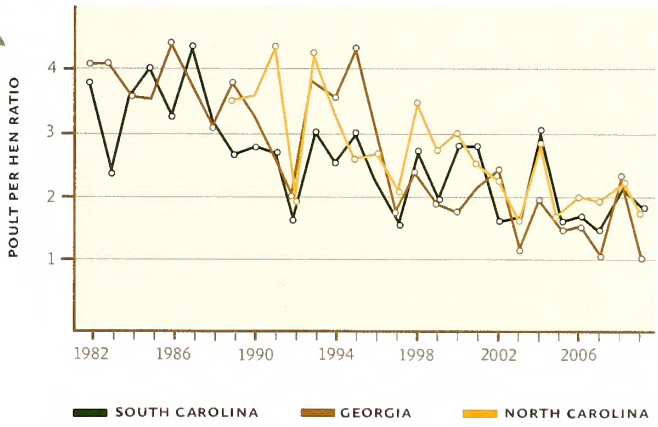
Although the list may seem short, addressing all of these research priorities is a tremendous undertaking that will involve multiple large-scale research projects, massive coordination efforts and quite a bit of time. However, the working group has been quick to begin addressing the research priorities. Priority No. 1 is currently being addressed by researchers at the University of Georgia. This effort involves pooling and evaluating tremendous amounts of trend data from all Southeastern states. Data to be evaluated include turkey population and productivity trends, habitat changes over time, changes in hunting regulations, weather trends and many other trends potentially associated with wild turkey population dynamics. The objective of this two-year effort is to evaluate these data and determine if hypotheses for the Southeast Wild Turkey Decline phenomenon can be developed. The results from this initial research will guide the Southeast Wild Turkey Working Group and other researchers as more focused research projects are designed and conducted to directly address other aspects of the decline.

Wild turkey biologists across the Southeast consider the Southeast Wild Turkey Decline a very serious issue. We have identified a potential time bomb with respect to management of turkey populations, and we want our constituents to know we are making great efforts to address the issue. However, research takes time, and patience is once again necessary. Luckily, our state's population of wild turkeys has not yet experienced the declining population and harvest trends observed in many other Southeastern states. With any luck, we can diffuse the time bomb before it goes off in North Carolina.

Evin Stanford is the deer, wild turkey and feral swine biologist for the N.C. Wildlife Resources Commission.



SUMMER WILD TURKEY POULT PER HEN RATIOS IN GEORGIA AND SOUTH CAROLINA FROM 1982–2009 AND NORTH CAROLINA FROM 1989–2009



Poult-per-hen ratios among wild turkeys have declined, in some cases steeply, throughout much of the Southeast. Biologists with the Wildlife Commission are working to understand the reasons behind the decline.

They may be small, but their appetites are huge, and they are of tremendous importance to nature's food chain. Meet our

Voracious Voles!

written by Helen Correll / illustrated by Consie Powell / nature activity by Anne M. Runyon

A small, rusty-brown critter scurries across a mossy area in our shady yard. He pauses at the edge of the woods, rises on his hind feet and sniffs the air. After a quick glance right and left, he dives under the leaf litter. He is smart to be cautious; he is a vole, and a host of predators hunt his kind for regular, tasty meals. This vole's shallow trails and tunnels in the loose soil and humus of the woodland floor, and burrows, are his only protection.

Meadow voles often kill trees by completely encircling, or girdling, the tree as they nibble into the inner bark.

Meadow voles have eyes and ears larger than most other voles because they spend most of their time above ground in damp fields thick with clumps of grass, in marshes and along rivers and lakes.

MARVELOUS MEADOW VOLES

If you live near open fields, pipelines, or power line rights-of-way, watch for meadow voles, which, at 5½ to 7½ inches long, are the largest voles in our state. They have dark, reddish-brown fur in summer, which turns gray-brown in winter; their tails are twice the length of their hind feet. Active day and night, they move through shallow runways along the soil surface just below the thatch, and also in underground burrows. They eat mostly grasses, leaves, seeds and the inner bark of small trees. Since meadow voles live both above and below ground, they make their nests either in grass clumps or in underground burrows. Female meadow voles have a territory, an area they consider their own, which they defend during breeding season. They have several litters of two to nine pups in a year, and the young reach breeding age in only 25 days.

FAMILY TRAITS

Voles are mice with short tails and small ears. Like rats, squirrels, woodchucks, beavers, guinea pigs and hamsters, voles are rodents. The trait that connects them all is the presence of a single pair of large incisors in both upper and lower jaws. These teeth never stop growing and are trimmed by endless gnawing on roots, seeds, bark, bulbs and tubers. Voles eat frequently, and can consume twice their weight of food in a single day.

There are approximately 155 species of voles in the world. Some species are nocturnal, some are diurnal and others are active day and night. Voles are active year-round and have a high rate of reproduction, which is balanced by their short life expectancy (from three months to a year).

North Carolina is home to meadow voles, woodland voles (also known as pine voles), rock voles and Southern red-backed voles. Each species prefers specific habitats, so if you see a vole, you can often determine what kind it is by where you find it.

RESOURCEFUL ROCK VOLES

Only in the highest mountains (over 3,800 feet) will you see rock voles. Rock voles are rare and are only found in high mountain spruce-fir forests or in open fields. At this high altitude they tunnel beneath leaf litter and under mossy rocks and boulders. Rock voles' distinguishing feature is the yellowish-orange hair on their snouts. Their body size is similar to that of meadow voles. They often cut vegetation and pull it down into their underground tunnel system, where they spend most of their time.

WONDERFUL WOODLAND VOLES

If you live near deciduous forests, watch for woodland voles. These voles live in a variety of habitats, but prefer forests. They are 3½ to 5 inches in length, with reddish-brown hair and tails only about one inch long. They have evolved small eyes and ears, due to lives spent mostly underground. Woodland voles are family oriented, staying together year-round in their burrows. Within the burrows they create large nesting chambers, lined with dried grass and leaves, that will have several exits. Females have one to four litters a year, with an average of two pups per litter. Unlike meadow voles, woodland vole females mate with just one male. Juveniles help their parents by doing various jobs, from babysitting in a nursery colony and grooming younger siblings to upkeep of the family tunnels, runways, and stored food reserves of tree roots, tubers, inner bark and flower bulbs. Woodland voles occasionally sneak to the surface to snack on tender green vegetation, nuts and fruit, or to collect for their family food cache.

The word rodent comes from the Latin word *rodere*, which means to gnaw.

Voles are a vital link in nature's food chain by being protein-rich meals for many predators, including black bears, foxes, bobcats, coyotes, skunks, raccoons and weasels, as well as bullfrogs and snakes. Great blue herons, owls, crows, hawks and eagles also eat voles. Vole populations go through cycles of abundance and scarcity, which may cause populations of predators to swing as well. During years of peak populations, voles are the primary food for some of their predators.

SENSATIONAL SOUTHERN RED-BACKED VOLES

In the mountains, keep an eye out for Southern red-backed voles, common at elevations above 2,500 feet. Their preferred habitat is damp spruce and hemlock forests. With bright reddish hair along their backs and grayish sides, it is easy to recognize Southern red-backed voles. They have small eyes, ears larger than other voles and short tails. Red-backed voles are active year-round, even in the cold mountain winters. Red-backed voles do not build tunnels or runways of their own, but instead use those of other tunneling creatures, such as moles, shrews, chipmunks or other voles, and sometimes simply use the cover of leaves in summer, or snow in winter. Females give birth two–four times a year to litters of three or four pups. Red-backed voles eat green plants, seeds, nuts, lichen, fungi and berries, as well as insects and snails. They cache food for winter.

Voles' diets of roots and tubers can cause problems when the little munchers live close to a home or business with expensive landscaping. "Munch-munch." *There go the roots of the azaleas!* "Chomp-crunch." *Where are my tulip bulbs?* One of voles' favorite treats is the inner bark of apple trees, but their girdling of trees can mean serious trouble to North Carolina's apple growers. Because voles are prolific breeders they are very difficult to control.

Get Outside

Are there voles living near you? Go outside and study your yard. Look for networks of shallow inch-wide trails between the grass clumps ending in small holes. Lift a stepping-stone and look for little tunnels or holes. For a fun experiment, place a slice of apple near a vole hole and cover it with a piece of board or empty flowerpot and weigh it down with a rock or brick. In a few days, check the apple to see if the voles have enjoyed their favorite treat. If there is a bit of apple left, look closely for the chisel-like teeth marks left by vole incisors.

Read and Find Out

- "Discovering Shrews, Moles, and Voles (Discovering Nature)" by Jill Bailey, Bookwright Publishers, 1989.
- "Rodents: Discover Series Picture Book for Children" by Xist Publishing, 2012.
- "Mammals of the Carolinas, Virginia, and Maryland" by William David Webster, James F. Parnell, and Walter C. Bills, Jr., University of North Carolina Press, 1985.
- "The Smithsonian Book of North American Mammals" edited by Don E. Wilson and Sue Ruff, Smithsonian Books, 1999.

In *Wildlife in North Carolina*

- "What's So Special About a Mouse?" by Roger A. Powell, January 1988.

Find out more about Project WILD Workshops and literature at the Wildlife Commission's website at ncwildlife.org.

THE WILDLIFE ENDOWMENT FUND

An Investment for the Future

Established in 1981, the Wildlife Endowment Fund allows the Wildlife Resources Commission to accept tax-deductible contributions for wildlife conservation. Money from the sale of lifetime licenses is also placed in this fund. Your donation or purchase will ensure that North Carolina will have a rich wildlife heritage for generations to come.

Lifetime License Form

Infant and Youth *(check appropriate block)*:

- ☐ Sportsman Infant $200
  (under 1 year old—Application must be received before applicant has attained 1 year of age.)
- ☐ Unified Sportsman/Coastal Recreational Fishing Infant $275
  (under 1 year old—Application must be received before applicant has attained 1 year of age.)
- ☐ Sportsman Youth $350
  (ages 1 through 11—Application must be received before applicant has attained 12 years of age.)
- ☐ Unified Sportsman/Coastal Recreational Fishing Youth $450
  (ages 1 through 11—Application must be received before applicant has attained 12 years of age.)

A copy of the birth certificate must accompany applications for infant and youth licenses. Birth certificate documentation cannot be returned.

Note: Pending satisfactory completion of the hunter safety course, persons who possess infant or youth licenses may exercise the privileges thereof when accompanied by an adult who is properly licensed to hunt in North Carolina. "Accompanied" is defined as maintaining a proximity to the hunter which enables the adult to monitor the activities of, and communicate with, the hunter at all times.

Adult (age 12 or older) *(check appropriate block)*:

- ☐ Comprehensive Inland Fishing $250
  (N.C. residents only—includes basic inland fishing, trout & trout waters on game lands)
- ☐ Comprehensive Hunting $250
  (N.C. residents only—includes basic hunting, big game, game lands & N.C. waterfowl)
- ☐ Sportsman $500
  (N.C. residents only age 12 or older—includes basic hunting & inland fishing, big game, game lands, trout & N.C. waterfowl)
- ☐ Coastal Recreational Fishing $250
  (N.C. residents only—includes coastal recreational fishing)
- ☐ Unified Sportsman/Coastal Recreational Fishing $675
  (N.C. residents only—includes some privileges as the Sportsman, plus coastal recreational fishing)

A federal waterfowl stamp must be purchased separately for all N.C. hunting licenses.

Note: On or after July 1, 1991, a person, regardless of age, may not procure a hunting license or hunt in North Carolina without producing a certificate of competency for completing the hunter safety course or a hunting license effective prior to July 1, 1991, or by signing the statement below that he or she had such a license.

Check appropriate block and attach required copy:

- ☐ Copy of Prior Year Hunting License
- ☐ Copy of Hunter Safety Certificate of Competence
- ☐ In lieu of copy, I am signing the statement below:

Statement: I certify that I was a licensed hunter prior to July 1, 1991.

Signature _____ Date _____

Visit us online at www.ncwildlife.org or call 1-888-248-6834 for a complete list of lifetime licenses, including those for nonresidents and 65 and older.

Lifetime License

Complete the following information if applying for a lifetime license. Be sure to check appropriate block(s) on reverse side *(please print legibly)*:

Name of Applicant _____

Daytime Phone _____

Mailing Address _____

Resident Address _____

County _____ Date of Birth _____ Driver License # _____

E-mail Address _____

Is this license a gift? ☐ Yes ☐ No If yes, mail license to ☐ Donor or ☐ Applicant.

License Donor's Name *(if applicable)* _____

Donor's Telephone # _____

Donor's Mailing Address _____

City _____ State _____ Zip _____

Method of Payment: ☐ Check ☐ VISA ☐ MasterCard

Acct. # _____ Expires _____

Print name exactly as it appears on credit card _____

Cardholder's Signature _____ Date _____

Personalize your Lifetime License for an additional $5:
Indicate your selection of letters, numbers, dashes, periods, commas and /or blanks up to 6 spaces: ___ ___ ___ ___ ___ ___

Indicate your personal message including letters, numbers, dashes, periods, commas and /or blanks up to 21 spaces:

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Signature of Applicant or Donor _____ Date _____

Note: Only adult lifetime licenses may be purchased by phone or online (VISA or MasterCard only). Call toll-free (1-888-248-6834) or visit us at www.ncwildlife.org. Use this form to purchase infant and youth lifetime licenses by mail.

Tax-Deductible Contribution

☐ I wish to make a tax-deductible contribution to the Wildlife Endowment Fund. Enclosed is my check for $ _____. *(Credit card payments cannot be accepted.)*

Name _____

Daytime Phone _____

Mailing Address _____

City _____ State _____ Zip _____

Make checks payable to: *Wildlife Endowment Fund*

Transactions are not considered final until the check has cleared the bank. Items purchased with a returned check will be made invalid. A service charge of up to $25 will be charged on any returned check. (N.C.G.S. 25-3-506)

Mail completed application and payment to:
NCWRC, License Section, 1707 Mail Service Center, Raleigh, NC 27699-1707

Office location: *NCSU Centennial Campus, 1751 Varsity Drive, Raleigh, N.C. 27606*
Telephone: 1-888-248-6834 (2HUNTFISH)

MAKE A

Meadow Vole

PAPER SCULPTURE

1) Cut out vole along black outline.

2) Fold vole in half along spine, and cut out yellow spot near shoulders.

3) Unfold, and fold down along the 4 ··· lines on head, creating forehead.

4) Curl ears forward slightly and glue tip of snout shut. (Trim edges of snout if needed.)

5) Fold down along the 4 ··· lines on rump.

6) Fold up along --- line in middle of rump, squeezing together the two triangles. Glue shut.

7) Fold tail sideways at base and then fold up at --- line. Add a bit of glue here at fold. Tail will lie flat behind your vole.

8) Curl white belly flap, match under right side, and glue.

9) Place a finger inside, and using other hand, pinch neck fold down to lower head. Curl ears forward if needed.

10) Fold feet up slightly along --- lines. Your meadow vole is ready to forage for food!

Indiana Artist Wins Duck Stamp Competition

Wildlife artist Jeffrey Klinefelter of Etna Green, Indiana, has taken top honors in the 2013 N.C. Waterfowl Conservation Stamp and Print Competition with his vivid portrayal of a pair of Northern shovelers sitting along the water's edge.

The painting, which is a mixed media of opaque watercolor and acrylic, will become the image on what is commonly referred to as the North Carolina duck stamp. It was unveiled Feb. 8th at the 18th Annual East Carolina Wildlife Arts Festival and the N.C. Decoy Carving Championships in Beaufort County during an evening preview reception.

Signed and numbered regular edition prints with mint stamps of the winning portrait will be available from the N.C. Wildlife Resources Commission's N.C. Wild Store, on July 1 for $145. The stamp is $10.

Wildlife Commissioner Mitch St. Clair represented the Commission at the unveiling in Washington.

This is the first year that Klinefelter has won North Carolina's waterfowl conservation stamp and print competition. He has won awards in other states, including Ohio, California, Colorado, Delaware, Oregon, South Carolina, Indiana, Nevada and Louisiana,where he placed first in 2012 with his painting of American wigeon at a marsh edge.

Klinefelter was one of 30 wildlife artists from 16 states to submit entries for the sixth annual N.C. Waterfowl Conservation Stamp and Print Competition. In 2008, the Commission began partnering with the East Carolina Wildfowl Guild, which sponsors the winter wildlife festival, to conduct a nationwide competition open to the public.

This year, artists could submit paintings of hooded mergansers, Atlantic brant, Northern shovelers, tundra swans or gadwall. In addition to Klinefelter's painting, the other top entries selected by a panel of judges were unveiled during the reception. They were:

- *2nd Place* – Hooded merganser by Richard Clifton, last year's N.C. Waterfowl Conservation Stamp and Print winner, of Milford, Del.
- *3rd Place* – Atlantic brant by Tom Crain of Branson, Mo.
- *4th Place* – Tundra swan by James P. Edwards of Raleigh
- *5th Place* – Hooded merganser by Jennifer Miller of Olean, N.Y.

Proceeds from sales of the print and stamp support the Wildlife Resources Commission's Waterfowl Fund, which generates revenue for the conservation of waterfowl habitat in North Carolina.

e NEWSLETTER

Get N.C. Wildlife Update—news including season dates, bag limits, legislative updates and more—delivered to your Inbox from the N.C. Wildlife Resources Commission. Sign up at ncwildlife.org/enews.

Remington Visits Watson

Miss Katie Watson drawn by Andrew Toler

In our 2012 Nov./Dec. issue of *Wildlife in North Carolina*, we profiled Miss Katie Watson, 97, in "The Huntress of Stanly County." Remington Arms got wind of the story and presented Miss Watson with a Versa Max shotgun at a local banquet for disabled hunters in November her family hosts every year.

"It was all a surprise to me," she said. "I have three Browning semi-automatic shotguns, so I told [grandnewphew] Wes Sells to put it in his gun safe. I told him if I needed it I know where it is."

That's not all. Andrew Toler, an inmate at the Franklin Correctional Center in Bunn, drew with pencil a beautiful copy of the portrait that ran in the story and had it matted and framed and sent to *WINC* to forward on. "That was real nice of him," said Miss Watson.

Undercover Wildlife Operation Bags Poachers

State and federal wildlife officials announced in February an undercover operation involving more than 80 wildlife violators and as many as 900 wildlife violations detected.

Primary violations stem from illegal bear hunting but include an array of wildlife and game law charges. The investigation continues and more charges are possible.

The four-year investigation targeted poachers in North Carolina and Georgia, with some work in adjacent states.

Officers with the Georgia Department of Natural Resources and the N.C. Wildlife Resources Commission infiltrated poaching circles to document violations including bear baiting, illegal take of bears, deer and other wildlife, illegal use of dogs, operation of illegal bear enclosures in North Carolina, and guiding hunts on national forest lands without the required permits.

Illegal bear bait NCWRC

Officers began making arrests Feb 19. Operation Something Bruin partners also include the U.S. Forest Service, the U.S. Fish and Wildlife Service and the National Park Service.

"Operation Something Bruin documented hundreds of wildlife violations," said Col. Dale Caveny, law enforcement chief for the N.C. Wildlife Resources Commission. "These arrests bring an immediate halt to those crimes and, we hope, will make would-be violators think twice before breaking the law."

"Wildlife is a shared public resource and conservation is a shared responsibility" said Gordon Myers, executive director of the N.C. Wildlife Resources Commission. "North Carolinians can assist wildlife enforcement officers in their duties by reporting possible violations. We all have a vested interest in safeguarding wildlife from poaching. By targeting wildlife thieves, Operation Something Bruin helps protect our outdoor heritage and conserves wildlife for future generations to come."

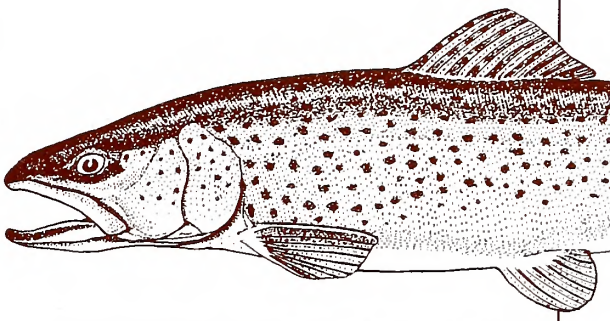
The U.S. Fish and Wildlife Service estimates that fewer than 10 percent of all wildlife crimes are reported. Help change that trend and protect the wildlife we all enjoy. Learn more at operationsomethingbruin.org. When you see or hear of a possible violation in North Carolina call 1-800-662-7137.

IN SEASON

In May and June, these seasons are open in North Carolina:

Wild Turkey (male or bearded only): through May 11

Trout: June 1, beginning at 6 a.m., harvest is allowed on Delayed Harvest waters.

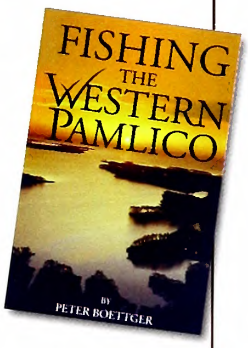


There is no closed season or bag limit for feral swine, coyote, groundhog, striped skunk, nutria and armadillo. There is an open season for taking beaver with firearms or bow and arrow during any other open season for the taking of wild animals.

Check the latest *North Carolina Inland Fishing, Hunting and Trapping Regulations Digest* for bag limits and applicable maps or visit ncwildlife.org.

About The Western Pamlico

Peter Boettger moved to Greenville in 1997. He started to fish around the area and learn more about the land and its denizens. He learned so much he has written a book about it.



"Fishing the Western Pamlico" is certainly a book about fishing, but it's also much more. It includes biodiversity in and among estuaries and how those factors influence the natural history of the species discussed. Local and regional cultural heritage is also touched upon.

One of the best things about the book is that Boettger's share of the proceeds goes to the Pamlico-Tar River Foundation, which has been working to protect and enhance the Tar-Pamlico watershed from Oxford to Ocracoke. The book is available online at Amazon and locally at Barnes and Noble.

CALENDAR OF EVENTS

Friday–Sunday, May 3–4

If you like boats you'll love The North Carolina Maritime Museum's 39th Annual Wooden Boat Show & the 6th Annual Beaufort National Boatbuilding Challenge (organized by the North Carolina Boat Building Heritage Foundation). Free sailboat rides, wooden boat displays, crafts for kids and a boatbuilding competition. Admission is free. For up-to-date information go to ncmaritimemuseums.com and beaufortchallenge.com.

Saturday, May 11

Take Mama fishing! Families are invited to the John E. Pechmann Fishing Education Center to try their hand at fishing. You may bring your own Fishing equipment and bait (Natural Bait Only). No minnows are allowed and this is catch-and-release fishing only. The event is free of charge and open to all ages. Registration will be done on site. Call 910-868-5003.

Saturday, May 18

Another event at the John E. Pechmann Fishing Education Center is a free fly-tying course. It is designed to provide the student with a basic knowledge of fly tying tools, materials, patterns and tying techniques. The course is taught in progression allowing the students to build on their skills and steadily advance toward more complex flies. In this course students will complete six fly patterns over eight hours of instruction. The course will be taught from 9 a.m. until 5 p.m. Limited to 20 participants. All tools and materials are provided. Pre-registration is strongly encouraged. To register call Tom Carpenter at 910-868-5003 ext.15 or thomas.carpenter@ncwildlife.org.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to mike.zlotnicki@ncwildlife.org, or call 919-707-0175.

Bear Creek Lake Boating Access Area Renovations Complete

NCWRC

The N.C. Wildlife Resources Commission has completed renovations to the Bear Creek Boating Access Area and it is now open to the public.

The refurbished site, on Bear Creek Lake in Jackson County, features two 14-foot wide, 90-foot long ramps. The bottom elevation of the ramps is 88 feet, so boaters can launch when the lake levels are low in the winter. A normal full level in the summer for Bear Creek Lake is 100 feet, but in winter it can drop to 91 feet.

A new floating dock with handicapped-accessible handrails was also installed.

"This is the busiest spot on the Nantahala chain of lakes, and the only public access on Bear Creek Lake," said Jeff Ferguson, an engineer with the Commission. "The lake is quite deep, and offers anglers bass, bluegill, trout and other species."

The Commission manages the lake as hatchery-supported trout waters, and stocks it with catchable-size rainbow trout. Hatchery staff will stock 6,000 rainbows in Bear Creek Lake this year—1,000 per month in March, April, May, June, October and November.

Duke Energy and the Commission jointly own the access area, and the Commission maintains it. The renovation was funded using Sportfish Restoration Federal Grant Funds and vessel registration receipts. Duke Energy plans to pave the parking area, install a toilet and build an accessible fishing pier.

Visit the Commission's boating web page for more information on boating in North Carolina, including an interactive map of more than 200 public access areas across the state.

A Good Year For Sea Turtle Nesting

KEN TAYLOR/NCWRC

From late April 2012 until mid-September, sea turtles laid 1,103 nests along North Carolina's coast—up from 967 in the previous year and 883 in 2010. This nesting season's numbers were the second highest since biologists with the N.C. Wildlife Resources Commission began statewide tracking of nests in the mid-'90s, according to Sea Turtle Biologist Matthew Godfrey.

While four species of the giant reptiles are known to nest on North Carolina's beaches, loggerhead sea turtles' nests make up the vast majority of nests each year. Green sea turtles, leatherbacks and, on rare occasion, the Kemp's ridley—the smallest of all sea turtles—also nest on North Carolina's beaches, but in much smaller numbers. A fifth sea turtle species, the hawksbill, is known to visit North Carolina waters, but no nests have been documented on the state's beaches. All are listed as either threatened or endangered under the U.S. Endangered Species Act.

Waterfowl camp for kids this summer

Looking for an outdoors-related camp for your children? Camp Canvasback is a summer program during July 14–19 that encourages youths to conserve and pursue waterfowl traditions, ethics and conservation.

Through a partnership with the North Carolina Wildlife Resources Commission, girls and boys participate in activities that help them understand waterfowl biology, wetland ecology, hunting techniques and other conservation practices.

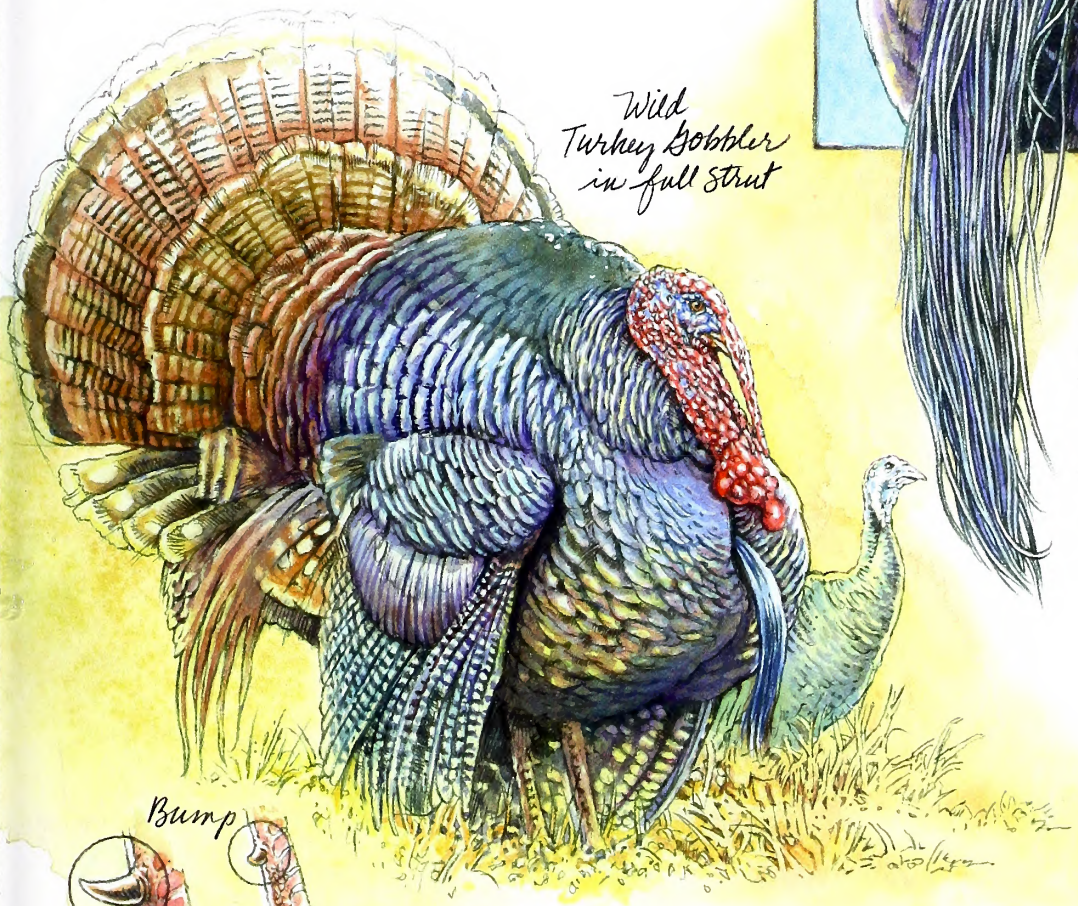
Skills taught include shotgun safety, shooting and firearm care, waterfowl identification, duck blind construction, GPS navigation, boat and water safety, and first aid.

For more information on Camp Canvasback, please visit eastern4hcenter.org/programs/camp_canvasback.htm.

Just What Is A Turkey's Beard?

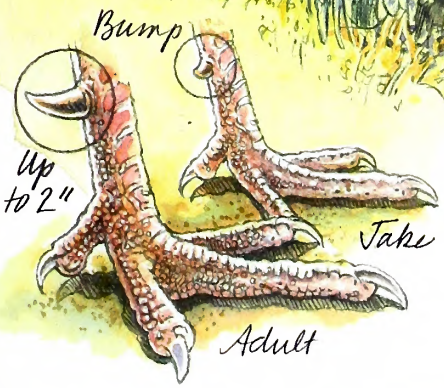
written by Clyde Sorenson
illustrated by Jim Brown

A WILD TURKEY GOBBLER IN FULL STRUT is one of the most impressive wildlife sights North America has to offer. With a glowing, tri-colored head bedecked with odd, fleshy growths, a spectacular barred and iridescent fan-shaped tail, wickedly sharp, hooked spurs, and a bizarre brush of "hair" dangling from its chest, the bird appears extravagant beyond reason. But each one of those exuberant decorations serves an important purpose in the social life and breeding behavior of a male wild turkey.



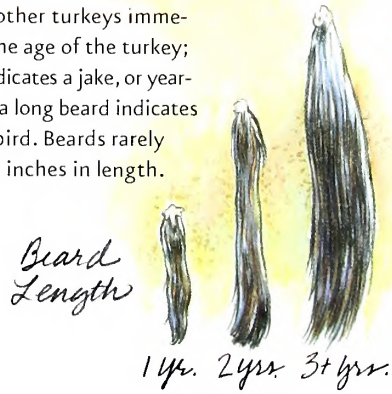
While the beard of the turkey looks like coarse hair, it's actually a cluster of very odd feathers. The filaments of the beard arise from a special swelling in the skin of the bird's breast; both sexes have this swelling, but only a few hens ever grow a beard. Unlike essentially all other feathers, the beard is never molted.

The fleshy outgrowths on the bird's naked head also play an important signaling role. The intensity of the colors indicates the reproductive condition of the bird. The length of the fleshy snood hanging over the bill is also an indicator of health; birds with lower internal parasite loads have longer snoods, and are preferred by hens.



The bony spurs of a gobbler are important weapons in contests with other gobblers and in self-defense from predators. Jakes have spurs that are little more than bumps; three year or older birds can have wickedly sharp, curved spurs up to 2 inches long.

The beard lets other turkeys immediately assess the age of the turkey; a short beard indicates a jake, or year-old male, while a long beard indicates a fully mature bird. Beards rarely exceed 10 or so inches in length.



Black and Bluegill

written by Jim Dean

A couple of years ago, after what seemed the umpteenth time that I had written about fly-fishing for bluegills, I swore that I was done with that subject. I have beaten those poor little panfish to death in print. Never again, I swore.

But with balmy weather here, I'm (of course) back on the water fishing for bluegills again (not giving that up). And, Heavens to Betsy, somebody has actually suggested that I write about a sinking panfish fly that I've mentioned before in earlier columns, and provide a photo. What can I say? I should know never to say never.

JIM DEAN

So here we go again. Many years ago, I read a highly technical magazine article that described how to tie and fish very realistic natural imitations of nymphs and other aquatic pond life for bluegills and other panfish. What a load of silly overkill, I remember thinking. Unlike trout and some other gamefish, bluegills aren't picky—if it fits, it's food. I still think fastidious imitation is unnecessary for bluegills, but my attempts to debunk that theory eventually led to the development of a simple sinking fly pattern that ironically also disproves my earlier notion that bluegills are entirely indiscriminant.

"Sinking flies are also a better choice when you're on the move searching for beds, or fishing deeper water."

Many fly fishermen who pursue bluegills, redear sunfish (shellcrackers) and similar panfish seldom use sinking flies. Instead, they prefer small floating poppers and foam spiders because they like to catch fish feeding on the surface over shallow spawning beds. It's hard to beat a white or chartreuse popper or a black foam spider, especially those with rubber legs. Old hands soon learn that it's generally more effective to simply let a top-water bug lie still most of the time, twitching or moving it only occasionally, rather than working it rapidly. They may also choose slightly larger bugs to keep from hooking so many tiny bluegills. Beyond that, there's not much else you need to know about fishing poppers and spiders.

Fishing sinking flies is, however, often more effective, and especially if you've already caught some fish on the surface over their spawning beds and the fish are somewhat spooked. Sinking flies are also a better choice when you're on the move searching for beds, or fishing deeper water.

Some 20 years ago—goaded by those exact imitation proponents—I spent a good bit of time tying and testing sinking panfish flies in various colors and configurations. I soon discovered that bright colors were not nearly as effective as dark, drab colors. I also found that adding contrasting rubber legs to those darker colored flies made them even more effective.

Eventually, I settled on a simple sinking pattern with a black body and white legs. I chose black for the body because hard-bodied black sinking ants were one of my favorite sinking patterns, and they worked even better when I added white rubber legs. I kept the two-hump, ant or spider-like shape, but substituted black chenille for the hard body because the fly was easier to tie. I wrap a fat chenille hump on the rear of the hook, add six white legs flared backwards just in front of that hump, then complete the fly with a smaller chenille hump ahead of the legs. The resulting black and white combination is highly visible in both clear and murky water.

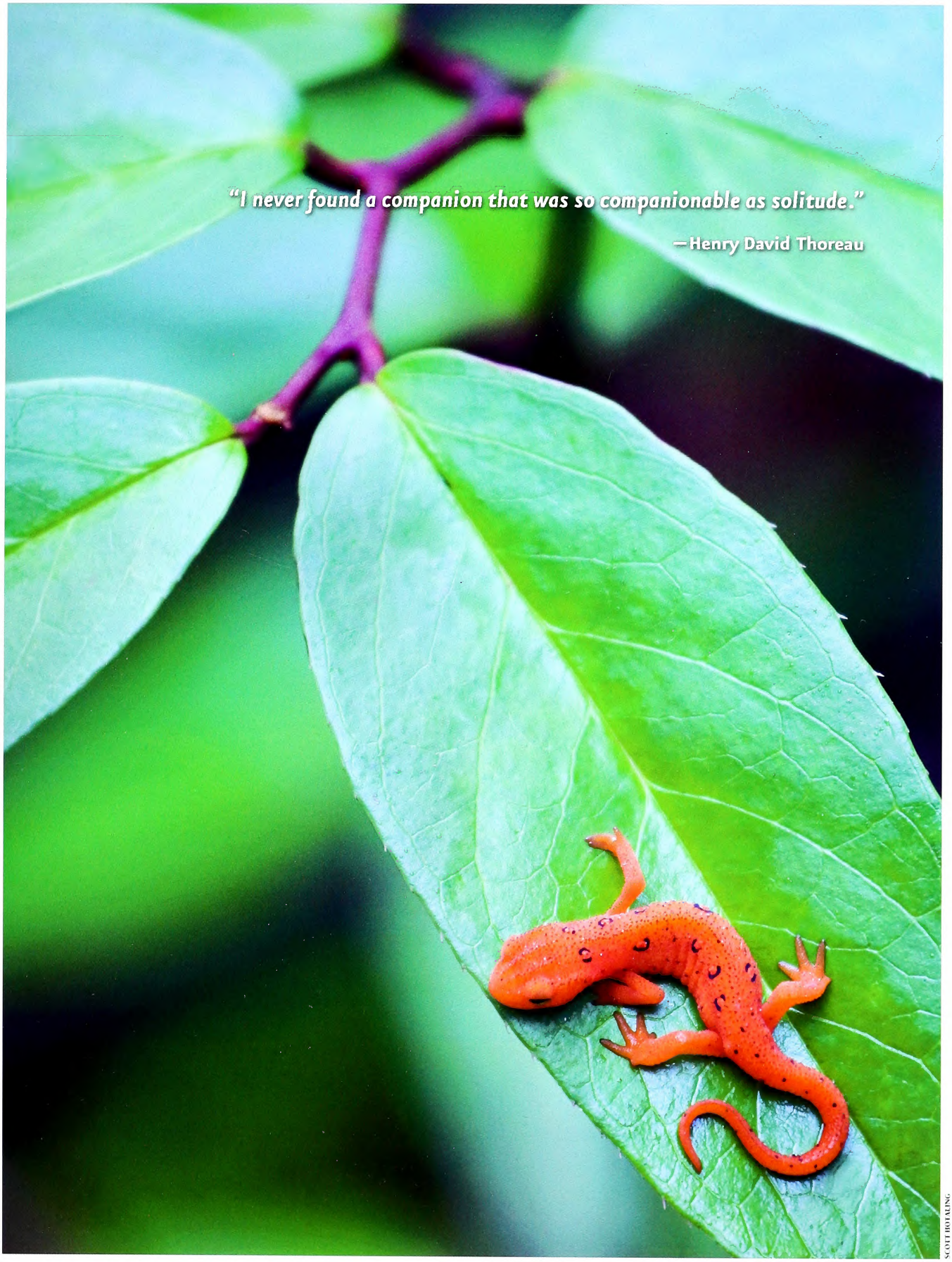
Although I most often fish these flies without additional weight so that they sink slowly, I add weight to some for use in deeper water. I make a few wraps of lead wire on the hook shank under the chenille for a mid-weight fly, and half a dozen or so wraps for a heavier fly. To make it easy to identify the weighted flies, I add one short stub of white rubber to the tail of the mid-weights, and two short stubs to the heavier flies. Even a novice can tie one of these in a couple of minutes.

To discourage strikes from tiny panfish, I tie most of these on a size 8 or 6 hook. Adult bluegills and shellcrackers have bigger mouths than you might think, and have no trouble inhaling these. I also tie a few on size 4 or larger hooks because bass love these flies. A few years ago, my fishing buddies and I gave the pattern a name—the "Black and Bluegill"—and it's by far the most effective panfish fly I've ever used.

I typically fish it slowly, merely raising the rod tip after each cast to take up the slack, then I retrieve it slowly with an occasional twitch, letting it sink from time to time. Sometimes, I fish two flies rigged in tandem. You'll feel most strikes, but you can also detect strikes by watching the end of the fly line for any slight movement.

These flies work not only on shallow beds during the spring, but also through the summer as bluegills and shellcrackers move out of the shallows to continue spawning, eventually establishing deeper beds that may be in several feet of water.

So will I write about bluegills yet again? Maybe.



SCOTT HOTALING

Red-spotted newt "red eft" stage

OUTDOOR MOMENT

IN THE JULY · AUGUST ISSUE

MELISSA McGAW/NCWRC

FARMING FOR WILDLIFE
Agriculture plays a major role in the day-to-day activities at the Wildlife Commission's game lands.

CLASSICAL BASS
Return to the first four decades of the 20th century, the golden age of bass fishing.

TINY AND TERRIBLE
Ticks and mosquitoes carry some very nasty diseases for outdoorsmen. Here's how to protect youself.

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